

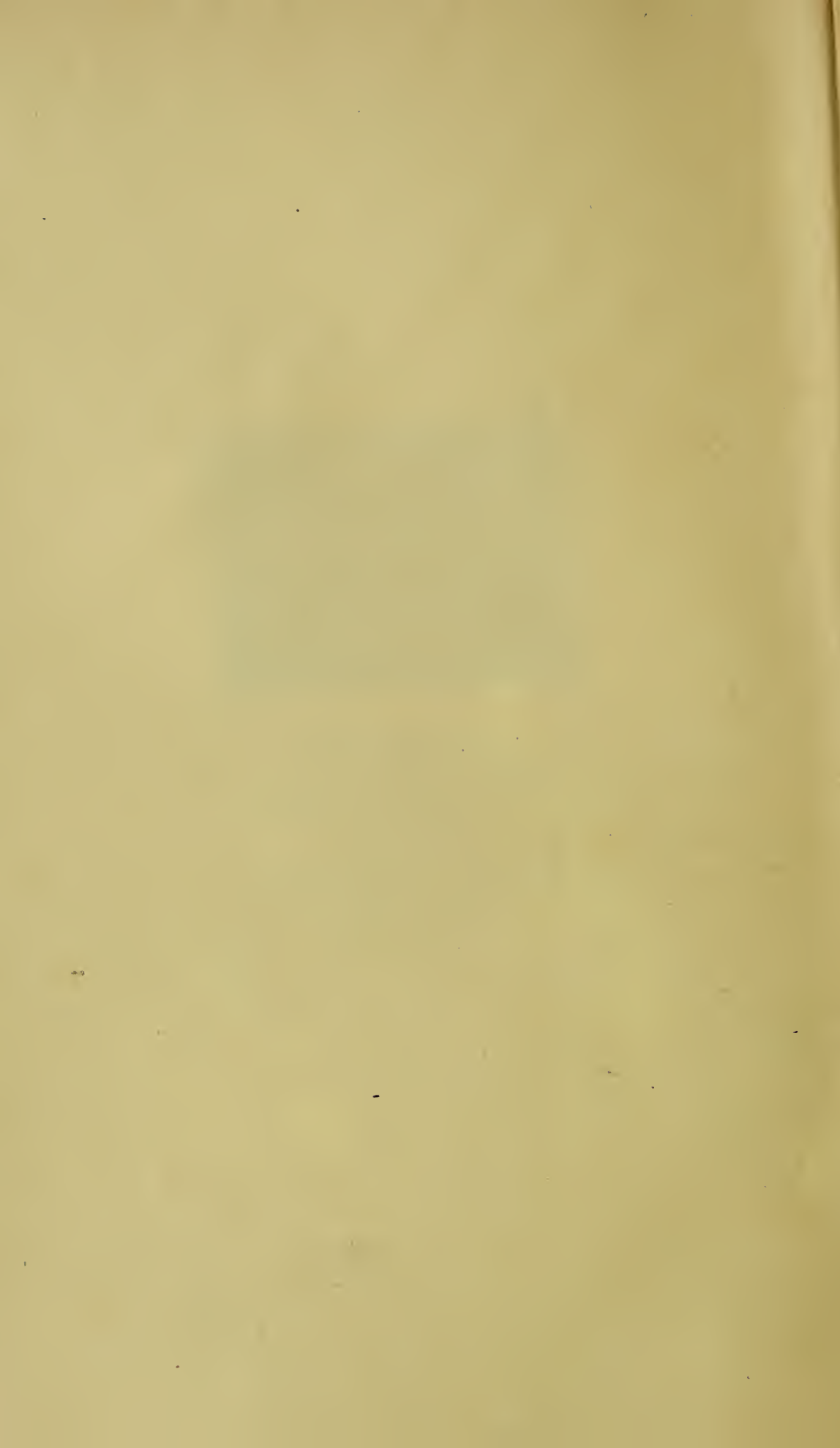


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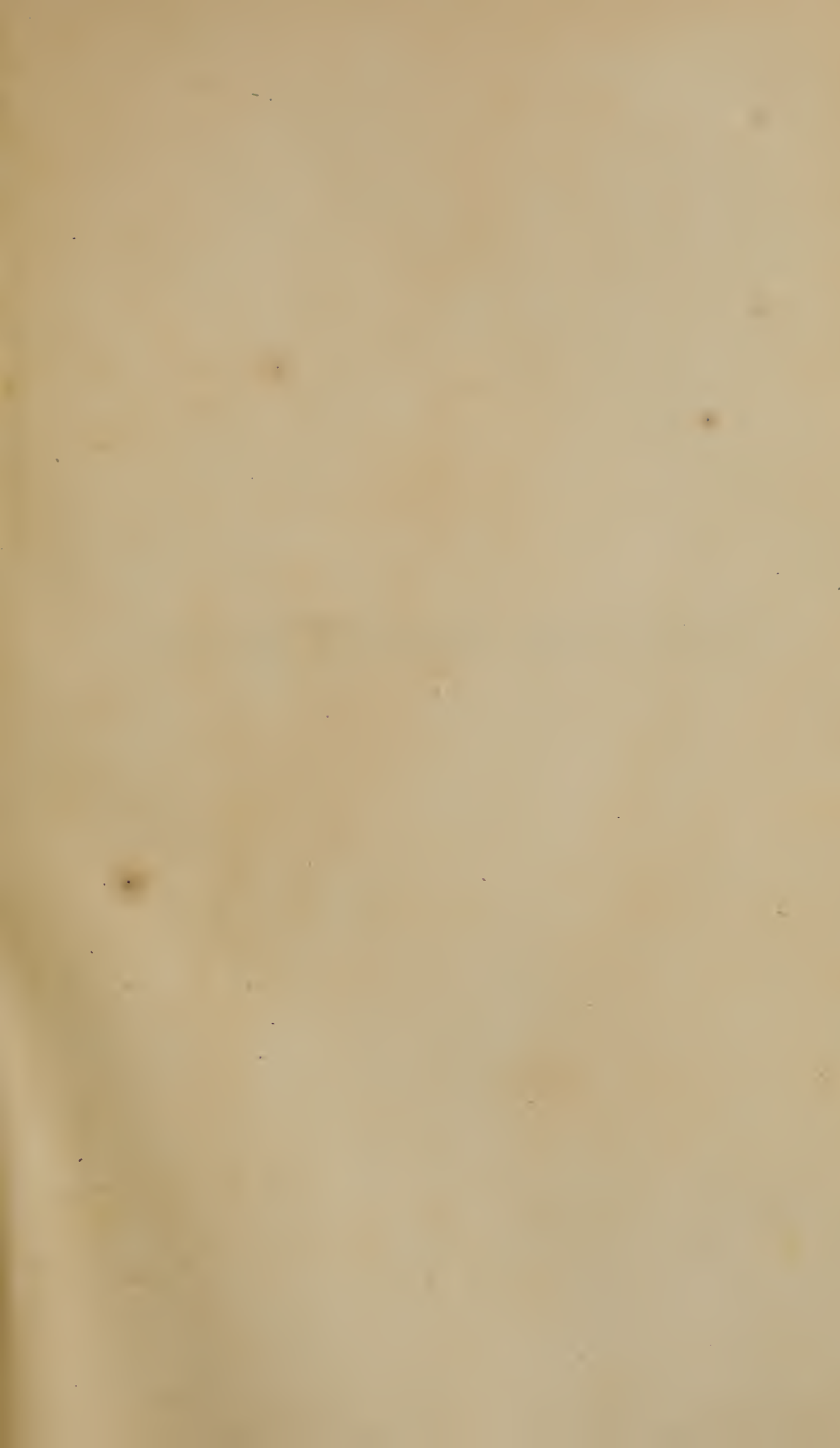
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DYEING, CLEANING, AND SCOURING.



THE ART  
OF  
DYEING, CLEANING, SCOURING,  
AND  
FINISHING,

ON THE MOST APPROVED  
ENGLISH AND FRENCH METHODS;

BEING PRACTICAL INSTRUCTIONS IN  
DYEING SILKS, WOOLLENS, AND COTTONS, FEATHERS,  
CHIPS, STRAW, ETC.

SCOURING AND CLEANING BED AND WINDOW  
CURTAINS, CARPETS, RUGS, ETC.

FRENCH AND ENGLISH CLEANING FOR ANY COLOR OR FABRIC  
OF SILK, SATIN, OR DAMASK.

BY  
THOMAS LOVE,  
A WORKING DYER AND SCOURER.

SECOND AMERICAN EDITION,

TO WHICH ARE ADDED  
GENERAL INSTRUCTIONS FOR THE USE OF ANILINE COLORS.

PHILADELPHIA:  
HENRY CAREY BAIRD,  
INDUSTRIAL PUBLISHER,  
406 Walnut Street.  
1869.



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Eastern District of the State of Pennsylvania.

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## PUBLISHER'S PREFACE

TO THE

### SECOND AMERICAN EDITION.

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THE first American Edition of LOVE'S ART OF DYEING, CLEANING, AND SCOURING having been entirely exhausted for some time past, while the demand has continued steady and unabated—the book being also out of print in England—the publisher has deemed it desirable to issue the present one. In it will be found some improvements, including the not unimportant one of a well-prepared index, without which no book for reference or practical every-day use, should ever be published.

He would take occasion here to return his thanks to Messrs. Andreykovicz and Dunk, of this city, for the valuable article contributed by them—GENERAL INSTRUCTIONS FOR THE USE OF ANILINE COLORS—which he feels satisfied must add greatly to the value of a book, which has already received such substantial evidence of public favor and appreciation, as well in this country, as in England.

PHILADELPHIA, Nov. 3, 1868.



# P R E F A C E

TO THE

## SECOND LONDON EDITION.

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THE Author of the Essay on the "Art of Dyeing, Scouring, and Cleansing" little imagined some few years since when, as a workingman, he committed to paper his daily practical observations in the dye-house, that a time would arrive when those observations, crude though they were, would be of service to his fellow-workmen, and that he would be called on to present to the public in a condensed and readable form the information he so ardently sought, and so successfully obtained; but if this was far from his thoughts, still farther was it that the sale of this work should so exceed the expected demand, and that within a few months of its first issue a second edition should be required.

This is a gratifying proof of the general merits of the book. It is so appreciated by its author; but, at the same time, not without acknowledging that there are many characteristics in connection with it which will not bear too closely the shaft of criticism to be pointed at. There are no pretensions in its compilation to literary attainment, for it is written by one who prides himself in being a working man, and its teachings are necessarily expressed in language that a working man may clearly understand. A quaintness there may be about it—simply because there has been no attempt to make it what it is not—the aim has been to lay before the public a plain, clear,

sober view of everything required to be known by those who are interested in an art, the fundamental principles of which have been hitherto but very imperfectly understood.

The author, with a desire to make this issue as perfect as possible, has made several additions which will be found exceedingly useful to those engaged in the trade; from this cause the work has been very much enlarged from the First Edition.

It is, however, confidently expected that the increased sale will admit of its being published at the original price, though containing so much additional information; and this assurance would appear to be well grounded by the numerous letters of approval which the author is constantly receiving from all parts of the country—by the favorable criticism of the press—and by the yet more certain index which points to the supply as not having been at all commensurate with the demand.

THOMAS LOVE.



## P R E F A C E.

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THERE is sometimes much useful matter contained in the Preface to a work, more especially when that work is purposely simplified and divested as much as possible of those technical terms of which so many pertain in the chemical analysis of preparing colors, and which only tend to puzzle the reader. On this account alone would some few remarks be profitable, but there are other reasons, in my humble estimation, which should be given why a working man, as I have been, and am still, should publish a book on so comprehensive a subject as the art of Dyeing—a subject on which there has been much written theoretically, and rightly written too, but on which no practical work has yet appeared—no one ever having thought it worth while to enlighten the working-man on the subject, and by this means to reduce the art to a perfect system, so that a man cannot go wrong anyhow.

Again, in a Preface, the writer of the book may be allowed a few words as regards himself, and of this, by way of apology to my readers, for any want of ability displayed in its compilation I most gladly avail myself of.

I should not have had the courage thus to intrude myself before the public had I not have made my trade my study. For more than forty years have I been as apprentice, journeyman, foreman, and now master, at work—work—work—and in constant practice during that period, so that my friends will admit that I have some claim to their confidence in this respect: all this time how much I had to contend with, owing to the want of a work such as the one I am now intending to publish—what would I not have given, and many more like me, at that time of day, could there have been a book discovered

anywhere that would have enlightened the mind on this useful art. It seemed as though all other trades had books to assist them in their calling but that of a Dyer, and in this no settled rules existed—a trade which, of all others, stood most in need of such; how necessary is it that the production of a certain color should not be left to chance—how essential to prosperity that the working of a dye-house should be methodically understood—and more requisite still that economy in all its branches should be practised.

To remedy this want is my excuse, if excuse be needed, for bringing out this work, a work which in a few years I am certain no practical Dyer will be without, at least such is my opinion.

In these pages I have given to the trade the results of a 40 years' constant practice, and adapted most minutely to the present time: all the improvements of whatever kind that have been successfully made in its every branch will here be found; and added to my own experience I have thought it proper to study well the writings of Parks, Bertholet, Tucker, Bancroft, Thompson, and Napier, and in some few instances have made extracts from their writings.

In my classification of the different branches of the art, after a brief history of the silkworm, I have commenced with Silk Cleaning and Dyeing, because it is the most important and ingenious branch in the Dyeing business. In this department, the various alterations and improvements, lately discovered in London, Coventry, and Macclesfield, are introduced. Hard Chemical names I have entirely omitted. We only want to understand the change made from one color to another, and how to effect it properly without injury to the goods.

Woollen Dyeing is a separate branch of the business. There are Wool, Worsted, and Yarn Dyers.

Cotton Dyeing likewise is an entirely different branch. Cotton being a vegetable substance and Silk and Wool being animal substances—the former requires a different mode of treatment.

Black Cottons, and Black Cotton Stockings form a distinct

trade in themselves, and Black Silk and Worsted Hose also another.

Hats, Black and Fancy Colors ; Chip, Straw, and Leghorn Hats and Bonnets ; Feathers, Furs, and Leather form distinct branches. Many masters get a living by following one branch only ; but I am glad to say there are stirring spirits in the Dyeing business that are not satisfied with following one branch only ; in fact I consider it a want of proper ambition in any man to be content to earn a living by only following any one, two, or even three branches of the Dyeing trade ; but there are some men who, while they can rub on, are satisfied. To an inquiring, active, and ingenious man the Dyeing business must be a very interesting one, from the different and sometimes unexpected results produced in trying the various processes ; and the more energetic and industrious a man is, the more certain he becomes that he has still to learn, and the more he learns the more he is convinced of his own insufficiency, and is thus stimulated to acquire fresh knowledge. It is only by constant working practice that he can become a proficient in his art, and make it at once a pleasure and a certain profit.

Feather Dyeing I have purposely introduced into this work because it is a part of our trade. In the shop there is no secret in the art of dyeing feathers, it is the same process as that of silk dyeing, both are animal substances, only the feathers take more time as it is necessary to dye them when nearly cold. But that which dyes the one will dye the other.

French cleaning I have also introduced into this work, as it is also a part of the trade. To the amateur Dyer and Scourer it will be found both interesting and instructive, and to persons in the country and colonies, and to such as reside far away from towns where there are no Dyers and Scourers. I flatter myself that, from the very explicit instructions given in this book, they will be able to judge for themselves what is best to do with their own silk, cotton, and woollen goods, as well as their garments and furniture when dirty or faded. It affords me great pleasure to be so far useful and instrumental in giving to the world what has caused me so much time and anxious trouble to put together, and I have no doubt but that any per-

son of a studious and ingenious mind will soon become master of it.

As far as my knowledge of other trades extends, I am certain there is none more profitable than a Dyer and Scourer where a master works in the Dye-house with his men. The men are more satisfied with their day's work, and the master observes how they are getting on, how they are using his drugs, and what time the work takes to perform. He is, moreover, ready to urge them on if they lag, or, if they get into a "fix," he is there at hand with his advice and experience to get them out of it, and when this is the case, both master and men are mutually satisfied, and on good terms with each other. Reverse this picture. The master who leaves his men to do the best they can with his drugs and his work in the Dye-house, is rarely satisfied with the men's work, neither are the men satisfied with him. He grumbles every day, hints that his men do not earn their wages, that his drugs are wasted, and his work spoilt. In fact, neither master nor man know exactly what a day's work for one man is, unless they work together, and I defy either of them to tell exactly, however experienced he may pretend to be.

In the arrangement of the different colors the reader will perceive that the subject is treated in a different manner to what it is in any other book he may have seen on dyeing and scouring, and it is hoped the trade will be satisfied that the method has not been adopted without mature consideration, it being certain that a strict rule cannot be laid down to go by in the classification of the different colors which this book contains.

Alterations in colors are made by means of materials which in themselves are colorless, such as, for instance, soda, potash, lime, and soap as alkalies; oil of vitriol, nitric acid, muriatic acid, acetic acid, tartaric acid, vinegar, lemon juice, and alum. The alkalies must be used carefully; there is no rule to go by in their management, except the exercise of that judgment which is to be acquired by experience. The acids are also very destructive to vegetable matter if not used with caution, nevertheless we cannot do without them in our work.



The acids employed must be diluted with water. Dyers go by taste, by taking up some of the liquor in the palm of the hand and putting it into the mouth. By this means we can tell whether we have enough or too little. Test papers are sometimes used, but it is nonsense to think of these when men are at full work in the Dye-house. A test paper, to determine whether liquor contains too much acid or alkali, is made by boiling a small piece of cotton in turmeric or safflower; when cleaned, a small pinch of soda should be put into each liquor, for a minute or two, and the two pipkins taken off the fire, then rinse separately in three or four cold waters. This, when dried, is the test for spirits. Cut the piece of cotton in two and put it into a little tartaric acid melted in cold water, so as to make it taste, dry, and you will obtain the test for alkalies. If you put a corner of the piece of cotton that was boiled in the safflower and soda in your mouth for a minute, it will, on withdrawing it, be a pretty pink, it being originally a buff color. Pink saucers are made from safflower.

Most people believe that a silk, woollen, or cotton article, not much worn cannot easily be injured. They are quite correct, but there is an agent by which it may be very quickly injured if people are not careful, namely, the rays of the sun through the glass windows. Dr. Ure, in his 'Elements on the Art of Dyeing,' vol. i. page 126, in an article on the action of air and light, says: "To the same cause (meaning the sun and glass) must be ascribed the decay remarked in stuffs themselves by the action of light. 'Among several examples which I might adduce,' says Dufay, 'I might mention only a curtain of fugitive crimson taffeta which had remained long stretched behind a window; all the parts which were opposite the panes of the glass were entirely deprived of color, whilst those which corresponded to the wood of the casement were much less faded, and further, the silk itself was almost destroyed in the discolored parts where the curtains could be torn with the slightest effort, while it retained elsewhere its usual strength. This injury to the curtains could in a great measure be remedied by having the blinds down when the sun is out.'"

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I think it necessary, before this book is commenced, to state in what manner it is intended to arrange the work. In the first place, it is requisite that the Dye-house should be described—its height, width, and length—for carrying on the general dyeing business, and what coppers are wanted, and their measurement; the cheapest and the best manner of making cisterns for water, iron liquor, alum liquor, logwood liquor, peachwood liquor, sumach, boiled-up green liquor, and old soap liquor; their height, width, and breadth, and what materials they are made of (for I have made these cisterns with my own hands twenty years ago, in the slack lime, assisted only by my apprentice, and have had them in constant use ever since); the punchers, tubs, and copper kettles—their height, width, and breadth. In fact, I intend to make, from the various Dye-houses I have worked in and seen, a model Dye-house, which shall be most convenient and complete in every respect, and at a moderate expense.

The next subject will be the Drying-room. The trade will be astonished at the various uses I intend to convert it to.

The glazing, calendering, finishing silks, and watering machines, shall also be attended to, and a minute description given of each machine. The different soaps we use in our business shall have their place, and my opinion of them.

The different kinds of drugs used in the trade, and a description of the best sorts, will follow. I shall give a practical account how one color should follow another in the same liquor, in the same copper, so as to economize both the dye-stuff and time. It is surprising how many different and even opposite colors may be turned out of one copper of liquor. Of course the proper drugs must be put into this copper, in order to produce the requisite color on the work.

There is another important matter I intend to introduce into this work, that of silk, wool, and cotton in their raw state—the different names that are given to them in the market, and the different prices.

From the prices and names of raw silk the reader will discover how manufactured silks are now adulterated, even with silk itself; and on seeing such a vast difference in the prices, he

cannot wonder at many a fine thick silk dress, when it came to his shop to be dyed, turning out, with all his care and judgment, entirely different to what he expected.

Also, from the names and prices of wool in the fleece or flock, he will learn the cause of one woollen manufactured fabric looking better than another. Superior silks and woollens produce fine colors without any difficulty. You will often do a day's work of woollens, moreens, and damasks, and be proud of the color—how quickly and easily they were done; you perceive by the lists of prices that you have been dyeing a superior wool. On the other hand, if, in another day's work of woollens, you do not know the cause of their being so long about, and taking more drugs than usual, you will find by this list of names and prices that you have been dyeing inferior wool. Dyers are generally pretty good judges of wools and silks, as may be expected from constantly handling, cleaning and dyeing them.

New pieces of silk and woollens, China crape, foreign and English shawls, gauzes and crapes, all new goods, are made unsalable for many causes. I shall name a few. They get mildewed; they become faded by being exposed for show in the drapers' windows; the more so of late years on account of the plate-glass windows, for when the sun shines on the glass, the heat comes with double force on the goods in the windows, and the colors very soon get faded. Besides, large quantities are damaged by shipwrecks and fires, and a variety of other causes. These are all sent to the garment dyers to be cleaned and re-dyed and re-dressed, to sell as new. Skein-silk dyers do not undertake such work—it is not in their line. People have no notion what a quantity of new silks, shawls, China crapes, and dresses, warehousemen and drapers have cleaned and re-dyed. So much is this the case that dyers' carts (dyers who could not keep carts but for the warehousemen and drapers' work) call every morning and evening for orders, and to bring home the work that has been done. There are master dyers in London who employ more than twenty men and women at drapers' work only. It may be guessed, then, what a quantity of work drapers require in cleaning and dyeing. Some drapers take in garments and shawls to clean and dye. They pay but a

poor price to the dyer. I shall not say here in what style it is done. The drapers should not have a shawl of mine to clean. A fair remunerating price for work sweetens labor, and that the dyer does not receive from the drapers. The new pieces of woollen goods, faded, damaged, or to be shrunk, come also to the garment dyers. There is also a very large and profitable trade carried on in shrinking woollens. New pieces as they come from the manufacturer are very much stretched by the tentering; besides, they are pressed highly, and if made up as they are, spot with rain and shrink. The woollen-drapeer, when he buys them, if he is a fair tradesman, sends them to the garment dyers to be shrunk and re-pressed. This second pressing does not spot with rain, neither do gentlemen's clothes shrink after this process when they are cleaned. There are numberless other sources from which the dyer and scourer procures work. The reader may judge when I tell him there are more than three thousand master-dyers and scourers within a radius of ten miles of St. Paul's.

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## DESCRIPTION OF DYE-HOUSE.

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### THE DYE-HOUSE—COPPERS, TUBS, VATS, AND CISTERNS, CALLED DYER'S PLANT.

THE *Dye-house*, if possible, should be sixteen feet wide and twenty-five long, seven feet high, the rafters a foot apart, so as they may be tented to cool the wool out of the copper when dyed, which I always do before I rinse them, and it makes a drying-room at night. The Dye-house must be open, if possible, at the south end, well covered over, and the coppers at the other end of it, with a pipe or tunnel over them, in connection with the chimney, or otherwise carried off into the open air; it matters little how the steam goes off from the coppers, but off it must go, for men cannot work in the Dye-house full of steam. The Dye-house must be flagged over with Yorkshire paving-flags, and at the end opposite the coppers there must be a drain, in one corner, about a foot from either wall, with a grating over it to prevent the work or the chips from getting through. The Dye-house must have a fall of about six inches, in all parts, from the coppers to the grating. There must be no horse or wooden stands on the floor of the Dye-house to put the work on, but instead of them fix yellow deal or beech pegs all round the Dye-house walls. Place them six feet from the ground, and two feet apart; they are to be two feet six inches long, twelve inches to be inserted in the walls, leaving eighteen inches of the peg clear of the wall. I have made these pegs of the spokes of old wheels well scraped, with the thick part inserted



in the wall and the tapered part out of it, well wedged in with cement and sand, and the edge is to be up, at two feet apart. There will be twelve on each side of the Dye-house to put the work on, and for blanket pegs, and three little tapered pegs on each side of the Dye-house like Puncher-handles, and about the height of a Puncher, above the tub.

To carry on anything like a decent business, it requires three coppers: a big copper, a middle-sized copper, and little copper, with a copper flange round the top of each copper; the flange goes over the brickwork in covering in the brick flues. It is a little more expense, but it is very clean. Should the dye stuff in the copper boil over the throat it cools on the flange and goes back again without being spoiled, which it always is where there is no flange. The form of copper that I like is thus: take an egg-shell, and knock off the narrowest end of it, and what is left of the shell is my model of a copper. Put a brim to it like the brim of a Quaker's hat; this brim or flange is nuted or fastened to the little border the coppersmiths invariably put on the outer edge of every copper they make. Three feet high is a handy working size for a copper, the flue four inches wide all round from the stop; the fire-place not too small. I know from experience that a small fire-place for a copper is dear at any price, for you must be always watching it and feeding it with coals, whereas if you have a large fire-place, when once the copper boils you can keep it up with rubbish and a little coal the whole day. The coppers ought to be set with red circular bricks, and when set, the bricks scoured well on the outside with a soft red brick; this scouring to be gently rinsed off with a soft brush, and pointed with white rims of plaster for a finish.

The supply of water for the use of the Dye-house is of the utmost importance to the master-dyer, it is the key to his success. Without water a dyer is of no more use than a sailor on shore. But notwithstanding this,



there are few master-dyers but are as improvident with their water as Jack proverbially is with his money.

A Cistern to hold water enough in a middling way of business in dyeing and scouring should be of these proportions: height, six feet, width, four feet six inches, and six feet long. A vessel of this measurement will hold 2000 gallons of water. It ought to be three feet above the level of the floor of the Dry-house, and made of bricks, flat tiles, cement, and sand, arched over at the top, with man-hole, pipes, water-cocks, to command and fill the Coppers and Rinsing-tubs.

A Cistern for the black preparation of nitrate of iron for silks, or any other mordant the dyer fancies, and they have plenty of fancies, to give his silks for black, should be six feet high, four feet wide, and five feet long, made of common bricks, cement, and sand, with the bricks on edge, well plastered with cement and sand all over, inside and out; two parts cement to one of sand; and the Cistern-Frame, with 4-inch yellow dial bedded in cement and sand on the top as a finish; a lid on it will keep it clean and from the weather.

This will hold about eighty gallons of water, or any other liquor you may choose to put in it.

A brick cement and sand Cistern for old soap liquor ought to be five feet deep, three feet wide, and four feet long, made as above. This is intended to put the best of the old soap liquors in, instead of throwing them away, to be used at any time for work they may be fit for, heated up or cold, with a little fresh soda or ash, added before they are used again. This vessel will hold about sixty gallons—to be framed also.

A brick, sand, and cement Cistern for peachwood liquor, fustic liquor, and logwood liquor to be kept boiled up ready at hand for use, three feet six inches long, five feet deep, eighteen inches wide, and two feet long, made as above, will hold forty gallons of liquor boiled up. The dyer need not be afraid to put boiling liquor into these compo vessels; I have had seven of them in use in my Dye-house every day for more than twenty years,

and they never wanted repair. The dyer knows that every time the dye stuff is put into them it must strengthen them. They get a thick crust on them in time from the repeated incrustations of the boiled extracts of the dye stuffs.

A slate Cistern for to turn over into the green liquor that is left after dyeing the green silks: height, three feet six inches, width, two feet, and two feet broad. This is a very useful vessel, as this very liquor will produce the best grass and myrtle greens by being left in it two or three days, and well rinsed in three cold waters, and each water made to taste with a little oil of vitriol in it. The silks that are put in this liquor to dye must be taken up and put back again, and twice a day a blue added, if required.

This old green liquor in the slate cistern is capital dye stuff for green woollens. When boiled in the copper, it will dye green moreens, merinoes, table-covers, and damasks. Of course, ebony, fustic, or Quercitron bark and Saxon blue will be wanted, and a little head-work to help it. It is cruel to ask a dyer to use his head, but it cannot be helped, he must do it.

A vessel for puce, lavender, or crimson is best made of earthenware of the form of drain pipes, round and straight like them, open at one end: you must take the liquor out of the top with a bowl. I have had a puce and crimson vat of the above description in use nearly twenty years, and they are as good as ever they were; their dimensions for a dyer that has a large business are four feet high, and eighteen inches wide, and they hold forty gallons of liquor each. But a vessel half this size is better, for when the liquor in these vats is old the color is not so good as when it is new, and when there is a small vat, there is less regret in throwing it away, and less expense in making a new one—that is the system I now adopt and recommend. Some dyers use slate cisterns and others use casks, well pitched inside to resist the spirits. But they do not answer, for the pitch cracks inside the casks, and the vat gets in the cracks, and

there is no helping it, in spite of every precaution. I have been working in Dye-houses with the men very quietly, when something was heard to crack like a shot. On turning round to see what it was, we found the puce or the crimson vat running into the sink, and before we could recover our surprise or get vessels to save it it was all gone: a hoop had burst on the cask, or the iron rod on the slate cistern given way. So there is not much to recommend these vessels as vats.

There must be four copper kettles and one copper bowl. They are to be made round with oval bottoms, two handles and a rim of a wrought iron rod at the top, the copper to wrap over the rod, the rod is to be outside. The first kettle is to be two feet high and eighteen inches wide: the second, eighteen inches high and sixteen inches wide: the third, sixteen inches high and fifteen inches wide: and the fourth, fifteen inches high and fourteen inches wide.

The coal-cellar should be as near as possible to the Dye-house, seven feet high, and five feet long by six. A cellar this size will hold four tons of large coal.

I find the best seconds more fit for dyers than any other sort. It is no economy to have very inferior coal, it occasions loss of time in waiting for the copper to boil. The men can go on with their work if they have good coals; it is a competition of men's time against coal. Coal is the cheapest; I have always found it so.

Upon the wall of the Dye-house, and under the blanket pegs, is fixed, five feet from the ground, a piece of wood, eighteen feet long, two inches thick, and six inches wide, with round holes bored in it, at three inches distance apart, into which are placed round sticks—about four feet six inches long—to hang velvets over, and which when not required for use can be taken out and laid aside, as they are not made a fixture. Some dyers use square frames for hanging their velvets, which are not so convenient nor so good as the above; handling velvets that are wet spoils them.

The sticks are not to be fastened in these holes, they



are to be put in when wanted, and taken away when done with. When we begin with our velvets, we will suppose they are blacks to clean and dip, we turn the cold logwood liquor out of the boiled-up logwood bin into one of our largest kettels on a stand or small firkin.

We put up a board on a tub or pegs inserted in the wall under these velvet sticks, put our work on it, and sort it; put the poorest color in first. We never strip them, as the dyers call it, but give them ten minutes in this (we have a clock to go by in the Dye-house, we go exactly to the minute, no guess), get up carefully across the pegs, wrong side down on the pegs, put in the next lot. So we get on till we logwood them all, and put them on the sticks singly, not having too many velvets in the kettle at a time for fear of breaking them. The next thing we do is to turn the logwood liquor we have used for the velvets into the logwood cistern again, with a handful of soda in it.

Under these velvet pegs, two feet nine inches from the ground, there ought to be three wooden pegs fastened with cement in the wall, eighteen inches apart. These pegs are of yellow deal; three feet long and two inches square; out of the three feet twelve inches are well fastened in the wall, leaving two feet out to use as a wooden horse, or to put the scouring-board on when wanted.

There must be three scouring-boards always at hand, smooth and in good repair; their measurement two feet three inches wide, six feet long, and one inch thick, made of the best yellow deal, firmly bound together. You must have a dry place to keep them in, so that they can't get stained or dirty, or knocked about to injure them. You must also have hard and soft brushes for satins and velvets, and scouring, besides carpet-brooms; all these are wanted in the Dye-house; also, the framing and other brushes for the shop and dry cleaning, and a small wire card for velvets; the card is a gentler method of raising the pile of velvets than a brush. Near the coppers there must be two pieces of

wood, nailed across the rafters, to put the sticks on that are wanted for the use of the coppers and the velvets, to keep them out of the way and prevent them from getting dirty.

Three Punching Tubs to clean and rinse the work : They must be of three different sizes, named large, middle, and small ; and four punchers. Also a winch : a winch is like a reel, with two handles or pins well fastened to each end of the reel. There are nuts in the rim of the copper to fasten an iron crutch by means of screws in the nuts, that is, the rim of the copper ; on these two crutches the handles of the winch are put, the goods are thrown over, and a handle put on and turned by one man, while another has a stick to keep the work open as it is turned out of the copper over the winch, and to push it under the liquor in the copper as it comes over the winch back into the copper. The work must not cool on the winch or it will get heat-wrinkled—that spoils the appearance of all sorts of work, and it is impossible ever to take them out.

I never tack or winch old Moreens, or Damasks, no matter how many breadths there are in a job ; I open them out across a puncher, and put the Dye-stuff for the color I want them into the copper ; then take them all up in my arms off the puncher, and put them in the copper, handle them well with a stick for an hour or so, the copper boiling all the time, and when done, damp the fire and take them out of the copper, one by one, and hang each on a tenter hook to cool and rinse, and they are never uneven or heat-wrinkled.

Handling means turning over on a winch moreens and damasks tacked end-by-end. New piece goods are handled over a winch in the same manner, and the dye-stuff rinsed out of them by a winch over a stream, which generally passes through a Dye-house when in the country.

*Handling the work* means to pass the work from one hand to the other by the selvage, still keeping it in the liquor or it will be uneven in color.

*Handling in the Copper* means when single garments are to be dyed while the copper is boiling. They are to be turned over and kept under the boiling liquor by means of two sticks, one in each hand; these sticks to be about a yard and a half long.

Wool in the fleece, dyed before it is made up, is, when scoured, thrown into the dye-stuff liquor in the copper, and well boiled. There must be no dye-stuff chips near this fleecy wool. The dye-stuff chips must be in open-made canvas bags. It is thrown up out of the copper by a fork on a "cray" to make any alteration in the dye-stuff the pattern requires, or when done to drain out the dye-stuff. The wool is then dried on hot-hearths and well turned over. Skein wool is reeled into regular hands, or hanks, as they are called, which have sticks or rods put through them, and are then dipped in the dye-stuff as you see men dip candles, and turned over and over on these rods until you have the color you want, the copper boiling all the time. Then rinse and hang them up to dry on the rods in the Drying-rooms.

A good workman will dye many colors in one copper, without changing the liquor in it; that is making what dyers call one color follow another in the same copper. Of course it must be helped with fresh drugs, according to the patterns.

Fleecy wool, manufactured into broad cloths, is dyed over a winch in the copper, rinsed and full'd in fuller's earth, and this earth well taken out of it by means of tuck mills, by a running stream; drained on a wooden horse and tenter'd, which is the cause of made-up garments shrinking when they are cleaned—they are stretched so much to make measurement and width, as well as to get them in shape for carding and pressing.

In that part of Dublin which some call the Liberty and others Pimlico, there is a square piece of ground and a building, with all apparatus for tentering and drying broad or narrow cloths. It is called the Tenter Ground, and was given forever to the manufactures of woollen fabrics of Dublin who like to use it, by a cha-



ritable gentleman, a friend to the aspiring industrious woollen weaver and dyer in that city. He is no friend to the poor who gives his money to the poor, but he is a friend indeed that puts the poor and willing man to work in the way of getting a living. There is a small sum of money to pay towards repairs, coals, &c. There are only two persons and their families on the premises, in two small houses—a superintendent and a watchman; the gates are open at six o'clock in the morning, and shut at six in the evening. The persons who bring their new pieces of cloths to be dried and tented have to do the work themselves, and each person has a private mark or number on his cloths or goods that must be compared with their entry in the book before they are allowed to be taken off the premises.

The Skein-Silk Dyers have Dye-houses and coppers, round and oval, as nearly like those before described as possible. There are in the skein-silk Dye-houses copper troughs like small horse-troughs, to lay the bags, or pockets, that contain the silk in skeins lengthwise, while in the process of soaping, to free it from its natural gum or gluten; and troughs for dyeing the skein-silk on rods to rest on the two edges of the trough.

Silk in its raw state usually takes from fifteen to twenty-five pounds of the best curd soap to the hundred-weight, to take the gum out of it; it takes from three to four hours in the boiling off, and loses in the boiling of the gum out of it about fifteen pounds in the hundred-weight, but more than its equivalent weight is returned in the process of dyeing, &c. If it has to be boiled twice—that is, in two separate, clean soap liquors—the second boiling frees it from the impurities it is sure to carry from the first liquor, and, as a matter of course, it must be finer and lighter from the second than it was from the first boiling off.

A *Cotton Dye-house* has hardly any difference from my first description of a Silk Dye-house. It must be larger and near a river, if possible. The Coppers, Tubs, Vats, and Cisterns are alike. A dyer having a large

business has generally a small steam engine for boiling the drugs, heating the liquors, and warming the Drying-room.

*A Drying-room* for a Dyer and Scourer is made as follows: it ought to be twelve feet high, fourteen feet wide, and sixteen feet long, at least—larger if you can; but by all means have it as near as possible to the above measurement, particularly the height.

Have long pieces of yellow deal, two inches square, that will reach from one end of the room to the other; knock tinned tenter-hooks in them, on the two opposite sides; the tenter-hooks are to be three inches apart; and these pieces, when tented, are to be screwed up to the ceiling, four inches apart. The ends of these long pieces of tented wood must be to the windows, not across, or the work, when hung up, will stop out the light. This must be particularly attended to. About four screws will do to screw up each tented piece to the rafters in the ceiling.

*A Stove* that will heat irons for the ironer in the Drying-room is very economical, for the fire that heats the irons will dry the work hanging up. The Stove may be placed in the centre or one end of the room, eighteen inches from the ground, with an elbow at the end of the room, then a pipe to run up the end or side, with another elbow into the chimney. There is not much expense or trouble with it, and it is as good a mode of drying as I have seen. Of course, the larger the business the more room is required. Where it is possible to have a cold Drying-room, it eases the Stove-room very much. Besides, brushing and a variety of other small dry cleaning-work could be done in it at the windows, and the work hanging up all the time.

*A Cockle*, for heating a Drying-room by hot air, is manufactured of cast-iron, which being formed similar to a nine-gallon cask when cut lengthwise in two, is laid upon the brick-work so that the hollow part is underneath. At one end of the cockle is made the fire-place, and to the other end is fixed a pipe made of sheet-

iron, about six inches wide—round, up, and over which is built a brick chimney, about two feet square, made air-tight; it is up the centre of this chimney that the sheet-iron piping runs, and protrudes out six or eight feet at the top. On each side of the fire-place are two square holes, nine inches wide and eighteen inches high. The air enters at these holes and goes to the extreme end of the cockle, and then, returning six or eight inches, passes into a small circular pipe, inserted in the chimney, and so on to the rooms upwards as far as the piping extends, the air becoming hotter the higher it ascends. At the top of the piping is fixed a cap to shut off the hot air or to turn it on. There are steam hot air pipes also, but as they are not suitable for garment dyers, I will not trouble the reader with a description of them.

As a generator of hot air, the cockle is expensive; for the room which contains the cockle and fire is scarcely warm, the room next above that is little better, whilst the third room becomes hotter, and the top room the hottest. Now, what can be a source of greater annoyance to a workman than when he finds he is obliged to go to the top of the house for the room most adapted by having more heat, but the room does not suit his purposes, particularly when top rooms are always built less in height than their companions respectively beneath? The cockle is also a great consumer of coal, which makes it still more annoying; for if you use a common stove, you can heat whichever room is most suitable to your work, and that, too, at little expense. I therefore deprecate the use of the cockle, though it is to be preferred for cleanliness to the common stove.

By having *the Frame* in the Drying-room for finishing the silks a great saving is made, especially by masters who do more garment, silk, and furniture work than any other kind. But the room must be at least eleven feet high, and then a man can work at the Frame with a lot of trousers hanging down from the waistbands over his head, as well as a lot of silk dresses, shawls, furniture, or any other sort of work that has to be dried, and his



head not touch them. The charcoal the Framer is using to dry his silk in the Frame will also help to dry the wet work hanging over his head. I have always used my Framing-room as a Drying-room. I have also a stove in the Framing-room for the Ironer, and she works in the adjoining room. This plan I find saves me tons of coals in the year, besides the saving of room.

*A Frame to finish Silks* over a charcoal fire is made of well-seasoned oak. There are three pairs of stands, four and a half inches wide, three inches thick, and three feet high. Each stand has a deal foot eighteen inches long, three inches wide, and four and a half inches thick, hollowed an inch and a half in the centre. Each oak-stand is mortised into the centre of each foot to make it quite firm. Each pair of stands has a square iron bar, four feet six inches long and one inch thick, with an elbow at each end six inches long, and two holes in each elbow for iron bolts or nuts. This iron bar of the Frame or elbow is let in three-quarters of an inch into the stand, six inches from the top, and well bolted through by the nuts. Twenty-two inches below this iron bar is another bar, of wood, also inserted in the two oak-stands. These oak stands are placed four feet apart, the two ends of the Frame overhanging two feet from the stands, and the feet well fastened down. On the wooden bars is placed the railroad, nine inches from each stand, for the carriage to convey the charcoal pan to and fro to dry the work. The rails are two and a half inches deep, and one inch and a half thick. They must be long enough to go from one end of the room to the other, and well fastened by the ends in the wall, so that the charcoal pan will not run off the rails.

On the wooden cross-bar is a cradle with four runners or wheels to run on this railroad. This cradle is to hold the charcoal pan, which should be made of copper or sheet-iron, three feet long and eighteen inches wide, the bottom flat, with a turned-up rim round it, and an iron wire at the outer edge of the rim to strengthen it.

In the stands, on a level with the iron bar, are two

round holes, two and a half inches in diameter, through which passes three wooden screws with three wooden nuts and handles, the nuts to be between the two handles, which are to be six inches long each. These are called flyers, and are placed outside the stands, to screw and tighten the work in the Frame. On the top of the iron stands are placed two long pieces of oak, called the Sides of the Frame. On the outer side the screws are mortised with a pin to hold them together; the pin is to fit loose, so as that they and the screws may be taken out at pleasure. The Sides of the Frame are to be fourteen feet long, three and a half inches wide, and two inches thick, with three pieces of wrought iron, to be fastened on the back side of the Frame, to hook under the iron bar, to keep the sides down and shift it about in the working of the Frame. The sides of the Frame are to be pinned with brass pins, the points of which are to be on the two edges opposite.

The edges of the silk for framing are knocked on with a heavy brush called a Framing Brush, and the silk is then wetted on both sides with a sponge dipped in hot water and size mixed together. The silk is then stretched tight by the screws, and the charcoal fire rolled beneath to dry it. When dried it is to be taken off the teeth, and another width put on with the brush as before; and so on until the silk dress is Framed. This frame will take three widths at a time, tacked one after the other. This is the whole account of making the Silk Finishing Frame; and Framing is of so much importance in a Dyer's business, that no dress after it is dyed would be fit to be sent home without it. Velvets are Framed also in the same manner, but sized on the back. The pile or face of a velvet is never wetted in the dressing, the stem that comes through the face or pile from the back is used with a soft brush to raise the pile while it is drying; after this a little oil is used, or put on a soft brush and rubbed into the pile, and it is finished.

The *Skein-Silk Dyer's Drying-room* is nearly the

same, but having no tenters, they hang up their hanks, when dyed, on rods, and keep them shifted while drying.

The *Cotton Dyer's Drying-room* is the same, but very high—for this reason, that when the pieces are dyed, they are put across poles, and let drop down near the floor, and up again, and so on until the room is filled. They use no tenter-hooks for this sort of work; they use tenter-hooks for other purposes, but not to hang new work on.



# LOVE'S

## PRACTICAL DYER AND SCOURER.

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### CHAPTER I.

#### THE ART OF SILK DYEING.

##### *Short Account of the Silkworm.*

It is pretty generally known to readers in the present day that silk is a secretion from the silkworm, elaborated through two small holes near the head. How the worm is reared; how it changes its condition with great rapidity; how it is supported by eating vast quantities of mulberry leaves; and how the Italian peasants prepare for the momentous period when the worms are to produce their silk—are matters upon which I cannot afford space to dwell at length. The following short sketch must suffice.

The silkworm (*phalena bombyx*), like most other caterpillars, changes its skin four times during its growth. The intervals at which the four moultings, or changes of the skin, follow each other depend much on climate or temperature, as well as on the quality and quantity of food. It is thence found that if they are exposed to a high temperature, say from 81 to 100 degrees Fahrenheit, the moultings will be hastened; and only five days will be consumed in moulting the third or fourth time, whilst those worms that have not been hastened take seven or eight days.

The period of the moultings is also influenced by the temperature in which the eggs have been kept during the winter. When the heat of the apartment has been

regulated, the first moulting takes place on the fourth or fifth day after hatching, the second begins on the eighth day, the third takes up the thirteenth and fourteenth days, and the last occurs on the twenty-second and twenty-third days. The fifth age, in such cases, lasts ten days, at the end of which, or thirty-two days after hatching, the caterpillars attain their full growth, and ought to be three inches in length; but if they have not been properly fed, they will not be so long.

With the age of the caterpillar its appetite increases, and is at its maximum after the fourth moulting, when it also attains its greater size. The silk gum is then elaborated in the reservoir, while the caterpillar ceases to eat, and soon diminishes again in size and weight. This usually requires a period of nine or ten days, commencing from the fourth moulting, after which it begins to spin its shroud of silk. In this operation it proceeds with the greatest caution, looking carefully for a spot in which it may be most secure from interruption.

“We usually,” says the Abbé de la Pluche, “give it some stalks of broom, heath, or a piece of paper rolled up, into which it retires, and begins to move its head to different places, in order to fasten its thread on every side. All this work, though it looks to a bystander like confusion, is not without design. The caterpillar neither arranges its threads nor disposes one over another, but contents itself with distending a sort of cotton or floss to keep off the rain; for Nature having ordained silk worms to work under trees, they never change their method, even when they are reared in our houses.

“When my curiosity led me to know how they spun and placed their beautiful silk, I took one of them, and frequently removed the floss with which it first attempted to make itself a covering; and as by this means I weakened it exceedingly, when it at last became tired of beginning anew, it fastened its threads on the first thing it encountered, and began to spin very regularly in my presence, bending its head up and down, and crossing to every side. It soon confined its movements to a very

contracted space, and, by degrees, entirely surrounded itself with silk; and the remainder of its operations became invisible, though these may be understood from examining the work after it is finished. In order to complete the structure, it must draw out of the gum-bag a more delicate silk, and then with a stronger gum bind all the inner threads over one another.

“Here, then, are three coverings entirely different, which afford a succession of shelter. The outer loose silk, or floss, is for keeping off the rain; the fine silk in the middle prevents the wind from causing injury; and the glued silk, which composes the tapestry of the chamber where the insect lodges, repels both air and water, and prevents the intrusion of cold.

“After building her cocoon, she divests herself of her fourth skin, and is transformed into a chrysalis, and subsequently into a moth, when, without saw or centre-bit, she makes her way through the shell, the silk, and the floss; for the Being who teaches her how to build herself a place of rest, where the delicate limbs of the moth may be formed without interruption, instructs her likewise how to open a passage for escape.

“The cocoon is like a pigeon’s egg, and more pointed at one end than the other; and she never fails, when her labor is finished, to fix her head opposite the pointed extremity. The reason of her taking this position is, that she has purposely left this part less strongly cemented, and less exactly closed. She is instinctively conscious that this is to be the passage for the perfect insect, which she carries in her bowels, and has therefore the additional precaution never to place this pointed extremity against any substance that might obstruct the moth at the period of its egress.

“When the caterpillar has exhausted herself to furnish the labor and materials of the three coverings, she loses the form of a worm, her spoils drop all around the chrysalis; first throwing off her skin, with the head and jaws attached to it, and the new skin hardening into a sort of leathery consistence. Its nourishment



is already in its stomach, and consists of a yellowish mucus, but gradually the rudiments of the moth unfold themselves—the wings, the antennæ, and the legs becoming solid. In about a fortnight or three weeks, a slight swelling in the chrysalis may be remarked, which at length produces a rupture in the membrane that covers it, and by repeated efforts the moth bursts through the leathery envelope into the chamber of the cocoon.

“The moth then extends her antennæ, together with her head and feet, towards the point of the cone, which not being thickly closed up in that part gradually yields to her efforts; she enlarges the opening, and at last comes forth, leaving at the bottom of the cone the ruins of its former state—namely, the head and entire skin of the caterpillar, which bear some resemblance to a heap of foul linen.”

The length of the unbroken thread in a cocoon varies from six hundred to a thousand feet; and as it is all spun double by the insect, it will amount to nearly two thousand feet of silk, the whole of which does not weigh above three grains and a half; five pounds of silk from ten thousand cocoons is considerably above the usual average. It has been estimated that the original silk filaments, as elaborated by the insect, would require nearly five hundred miles of length to weigh one pound. When we consider, therefore, the enormous quantity of silk which is used at present, the number of worms employed in producing it will almost exceed our comprehension. The manufacture of the silk, indeed, gives employment and furnishes subsistence, to several millions of human beings; and we may venture to say, that there is scarcely an individual in the civilized world who has not some article made of silk in his possession.

In ancient times, the manufacture of silk was confined to the East Indies and China, where the insects that produce it are indigenous. It was thence brought to Europe in small quantities, and in early times sold at so extravagant a price, that it was deemed too expensive

even for royalty. The Emperor Aurelian assigned the expense as a reason for refusing his empress a robe of silk; and our own James I., before his accession to the crown of England, had to borrow of the Earl of Mar a pair of silk stockings to appear in before the English ambassador, a circumstance which probably led him to promote the cultivation of silk in England.

The manufacture of silk was introduced into this country in 1718, at Derby, by Mr. John Lumbe, who travelled into Italy to obtain the requisite information; but so jealous were the Italians of this, that according to some statements which have obtained belief, he fell a victim to their revenge, having been poisoned at the early age of twenty-nine.

The use of silk is said to have been well known in the East some thousands of years before it was known in Europe. The Chinese to this day take the gum out of their silk without soap or any alkali, and do not injure it in doing so. The Nankin silk is much finer than what we produce in Europe, although the silkworm is alike all over the world. They keep this art to themselves—we cannot do it like them. No one can deny that the colors of their shawls, silks, and handkerchiefs are excellent.

The East India Company has for many years employed more than half a million of persons in India in hatching and tending silkworms and manufacturing silk. The annual consumption of silk in Europe is more than ten millions of pounds; and taking the average market-price in London this year (1854) of China silk at 10s. 6d., Bengal at 10s., Persian at 10s. 6d., and Italian at 20s., the average price of each pound of raw or unmanufactured silks may be reckoned at 15s. Only think for a moment what a quantity of eggs, worms, and mulberry trees, and what a number of men, women, and children are employed to produce this weight of silk! Then come the silk factors, the dyers, the silk throwsters, the weavers, and numbers of other trades and callings, all dependent on the protection of this little creature, less than three



inches long; and what attention must be paid to it to keep up the supply! It is a well-known fact that the bones of pigs become dyed red by eating madder in the countries where madder grows. This has led some scientific breeders of the silkworm to try pure ground indigo, slightly sprinkled on the mulberry leaves; and the result is that the worms fed on them have produced a blue silk thread. Other experiments are being tried in feeding, to produce a variety of colors, which, if successful, will save us poor Dyers a great deal of trouble which we do not want.

### *Ungumming the Raw Silk.*

Silk as it is taken from the worm is an oily and resinous substance, with a thick coating of gum on it, and it is a vaunterine or red fawn color. In this state it is unfit, except in some cases, to be sent to the weaver to be made into fabrics. It is true that nearly in this state it is dyed many colors; for in this ungummed state it does not lose any of its weight, as it does by boiling off the gum. The dye-stuff it absorbs while the gum is in it adds to its weight considerably. It may be dyed with the gum in it, as the Dyers call it, with any degree of heat up to a scald, and with any dye-stuff, without disturbing the gum. All of the different sorts of gum in use are dissolved by hot or cold water, or any other liquid; but the silkworm gum, or resin, defies all liquors, hot or cold, and cannot be taken out of the silk by any safe means yet found out in Europe, except by boiling in soap, or an alkali.

Pot-ash, pearl-ash, or soda—any of the three—will take the gum out of it by boiling in a copper. They will not remove it either in a cold, warm, or scalding state; it must be boiled out by the agency of any one of the three, or by the agency of all three in one copper, if you like. The three together will not do it any more injury than either of them by itself would. Great caution must be exercised in using these alkalies, as one

pound of pot-ash is as strong as ten pounds of soda, and one pound of pearl-ash is equal to five pounds of soda. The copper must be boiling hot before any of the above alkalies are put in. Greater caution is necessary than in using soap.

In freeing the silk from the gum by these means you injure the silk; because there is no oil in these alkalies, and the gum cannot be dissolved without an alkali. Diluted spirit of any kind will not in the least affect it.

The simplest and the best way to take the gum out of the silk is by soap, pure as it comes from the maker's, without any addition of alkali. The gum is gently dissolved by the soap, and the fat or oil that is in it nourishes the silk, as it does all animal substances.

The silk, as it comes from the worm, is reeled into hanks, and an oval copper, full of pure clean water, got on to boil, with about a quarter of a pound of the best mottled soap cut in pieces to one pound of silk. The copper must be kept well stirred with a stick until every bit of the soap is melted. It is now a strong soap liquor, boiling hot, the copper door is opened, and the fire damped down, with only sufficient to keep it up to a scald.

The skeins, as I said before, are reeled off into hanks, which are put on rods that will rest across the oval copper; the skeins of silk are then put on the rods, each skein to be kept nicely apart, and that portion which hangs down from the rod is dipped into the soap liquor, the Dyer holding the two ends of the rod, and resting them on the sides of the copper, and so leaving these skeins on this first stick to swim down in the soap liquor. He then takes rod after rod and does the same with them until he has filled his copper.

This done, he begins with the first rod, and turns the skein bottom upwards, and so goes on regularly one after the other until he comes to the last one he put in the copper. By this time, the gum on the silk begins to dissolve, and the silk to glisten; the gum, losing its stiffness and giving way, the hanks lose their bulk, and

the silk drops straight down into the copper. It is done now, as far as the first soap liquor is concerned, and the rods with the silk hanging on them are taken out of the copper and put on the pegs to drain and cool, and to be opened and combed gently down with the fingers, the skeins still hanging on the pegs.

The next process is the *boiling off*. Each skein of silk is loosely tied at the ends as they hang on the peg; this is done to keep them from mixing or tangling while boiling in the bags in the copper, as well as for the Dyer to lift them out of the bag when he opens it at the side. On the second boiling, he has only to lift up each skein by the cord and put it to drain on the pegs, If he did not cord them they would get entangled, and all in a jumble in the pockets while boiling off. Nine or ten of these hanks are put in a linen bag, or pocket, as Dyers call it. The bags are about four feet long and three feet wide, sewed up at each end and on one side, the other side being left open. The pocket, in this state, is laid flat on a board, the unsewn part upwards. The skeins of silk are placed lengthwise in it, and about twenty pounds weight of silk put into it. The bag is now sewn up with twine, and is ready to be put into the copper.

A copper is got on with clean water, and half the quantity of soap used for the first liquor is cut into it. It is now made to boil, and the soap well melted; the bags are thrown in the soap copper, and well boiled for an hour, the Dyer not leaving it for a minute, but stirring the bags with a stick and keeping them well up from the bottom and under the liquor. The bags will stick to the copper if they are not well watched. When the time is up, take out the bags, which are thrown out on a wooden rail with four handles to it, that two men can carry from the top of the copper to the pegs the other side the Dye-house; the end of the cord is now cut in the pocket hole, the string is drawn out, the Dyer takes hold of the cord that ties the silks in the bags, and lifts them up on the pegs to drain, and nicely



combs and stretches them down with his fingers while they are cooling, and begins to sort them for their respective colors, taking the whites first.

Silk with the gum in it as it comes from the worm is boiled in pure clean water by the Dyer for particular purposes, but not for particular colors; very far from it, it loses about an eighth of its weight by this boiling, and leaves the liquor it is boiled in a dingy fawn color. This water boiling reduces the gum of the silk, and makes it very porous. By this process the silk does not show any lustre; it makes olives, dark browns, and blacks quicker, cheaper, and heavier than when boiled in soap. Cheap silks thus prepared are worked in the loom by the weaver thus: one thread that is boiled in water for the backs of velvets, silks, and satins, and one thread that is boiled in soap for the face of them.

Cheap raw silks intended for cheap fabrics are taken in skeins and tied gently at each end; the bags laid flat, the skeins laid lengthwise; the pocket-hole sewn up, twenty pounds of silk to each bag, and thirty pounds of soap to the hundred-weight of silk in the copper. The copper, an oval one, is got on to a boil, and the soap well melted. Now the bags are thrown in and boiled well for four hours, the Dyer never leaving the copper all this time, but stirring them with a long thick stick, keeping them under the boiling liquor, and well up from the sides and bottom of the copper. The gum that is leaving the silk is forcing itself through the sack in the boiling copper, and would fasten in a minute to the bottom and sides of it if not well stirred and watched. In boiling the gum out of the silks they lose a quarter of their weight, which the dyeing makes good, and more than good, for they tan it with sumach, sal japonica, or cutch; and it is usual for a Dyer to return to the silk manufacturer double the weight of raw silk he had to dye. Nearly all drabs, clarets, blacks, and browns are tanned, or, more properly speaking, stuffed, at least one thread is done so.

When the boiling-off time is up, the copper fire is

drawn out, the ladder is thrown across the copper, the bags one by one are thrown upon it and carried to the pegs, the pocket is cut, the string drawn out, and the Dyer lifts the silks across the Dye-house to the peg and hangs them up. While hanging up and cooling, he passes his fingers through them. They are now ready for dyeing any color as common silks.

It is my intention to follow the orders the Dyer receives from his employer in the Dye-house, and take the silks after boiling the gum out of them, the whites of course first. There is one white that is made from the silk in its natural state without any sort of boiling, which I think ought to be first.

You must choose from the skeins the palest-colored hanks; wet them in very hot clean water, with a little blue in it; wring them out of this, and sulphur them in a very close, small, low room, made air-tight. Raw brimstone in lumps—not ground brimstone, must be used. The room must be air-tight; chimney and windows stopped; even the key-hole must be closed.

Put the brimstone in an iron pot on the ground; throw a small lump of red-hot iron into it, and gather the pieces of brimstone round it, and escape out of the room quickly, closing all the places after you. Next morning, when the fumes of the brimstone are exhausted, open the door and windows, and let the fresh air in. Take your silks down to the Dye-house, give them another warm water with blue in it, and brimstone them again. All depends on what sort of a white you want, whether you use blue again in wetting your silks out, or whether you are obliged to wet them out and sulphur them a third time. You can make them any dead or blue white you like while you are about it; all depends on your orders.

The silk, in its raw state, made white by sulphuring, is to be woven into the backs of white satins, white watered silks, crapes, and gauses; and like white flannel, turns yellowish every time it is cleaned if any heat is used in the cleaning. White silks or flannels ought



never to be wetted in any liquor without having a little blue and melted curd soap in it, and should be done with dispatch, and hung up to dry in a warm room directly.

The best silks that have been boiled off in soap to take the gum out of them, intended for a blue white, must be azured, as we Dyers call it; that means it is to have a little blue in spring water, wrung out, and hung on rods in the sulphuring-room, the windows and doors closed, brimstone set alight, and left safe for the night. In the morning, if the white is not what you like, the process is to be repeated.

Silk is not to be sulphured for any other colors except for blue and white. The sulphur destroys all dye-stuffs. We can take it out with an alkali if we wish, but it is seldom done unless we spoil a white or a blue, and want to make it some other color, except green.

There are Milk White, Blue White, Pure White, Pink White, Flesh White, China White, and French White. All these Whites are done in different ways, which I shall proceed to describe.

1. *Blue White*.—The copper is got on with clean water, and, when boiling, is made a nice thin liquor with curd soap; the silks are sorted, and put on the pegs for the different Whites to be dyed. Those for blue white are put on the rods. The copper door is opened, the fire gently damped, the copper kept all but boiling, there being nothing in it but clean soap and water. The dyer holds each end of the rod in his hands, and dips the silks in the liquor; lets them stop in for five minutes, turning them bottom upwards on the rod, and giving them five minutes more. Placing this lot on the pegs to drain, you put a little blue in spring water, and put the silks in it, and pass them over the rod until you have the shade of white you want. Wring them out of this, and hang them up in the sulphuring-room to whiten.

2. The next in the same copper is *Pure White*. Do

the same with this as you did with the above, but give it no blue in the rinsing; wring it up and hang in the sulphuring-room to whiten. These two whites, blue, and pale, must be regularly sulphured.

3. The next is *Milk White* in the same copper and the same liquor. Do exactly the same with this as you did with the other two—with this exception, it is not to be hung in the sulphuring-room, but wrung and hung up in the regular drying-room.

4. The next in the same copper and the same liquor is the *Pink White*. This color some Dyers make with the extract of safflower, others cudbear, and others orchil. For the sake of economy, we will take cudbear, because the French whites and peaches will follow in this copper. The proportion of cudbear must be according to the quantity of work you have to dye pink white. Put the cudbear into a fine muslin bag, give it a boil in the copper, until you get what color you want out of it, take it out and put in your silk as above, keeping it turned on the rods till you get the required color; get it up to drain, rinse in weak sour, and hang up in regular stove-room.

5. The *French White* and *Peach* in the same copper and the same dye-stuff. The peach wants more cudbear than the French white. Give the silks time and turning on the rods, rinse without sour, and hang up in regular stove-room.

6. The *Flesh White* is done with annotto in a bag the same as the cudbear, but there must be a clean soap-liquor copper for this color. Act in the dyeing with this as you did with the preceding whites. Many other colors can be dyed in this copper, but I must confine myself to whites now.

I commenced the art of dyeing silk with a history of the silkworm, and then described the method of discharging the gum out of the thread. Unless this could be done, and done safely, the production of the silkworm would be of very little service to mankind. Having treated these two important subjects with the

best of my ability, the next was that of the different *Whites*, with the gum in and the gum out of the silk, being the finish of the process of boiling off in soap and water. I must now begin with the method of cleansing the new piece goods, China crape shawls, crapes, gauses, garment work, and describing the different soaps, coppers, and processes they have to go through before they are fit to be dyed. My reason for so doing is, that whatever dye-stuff is used to produce any color in the new skein silks, exactly the same must be used when silks are produced from the weaver's loom or in garments.

Having carried my reader through a description of cleansing new silks, I must for his further information give him a description of cleansing the old silk work for re-dying and re-dressing, and begin first with:—

*Direction to make Soap, Hard and Soft.*

To make soap it is necessary to employ a fixed alkali in a caustic state. Spanish barilla or Scotch kelp is broken in pieces, and when mixed with a sufficient quantity of quicklime to absorb the carbonic acid, the whole is thrown into large iron or wooden vats covered with water; at a proper time the water with the caustic alkali is let off into iron receivers below, and the vats are covered again with water and well raked, and after standing for a night it is let off as before. This is called soap-boilers' lye. Russian or English tallow is put into a large iron boiler and melted with a portion of this lye. At first the tallow appears liquid like oil, but while boiling it acquires by degrees consistence; when the alkali is combined with the tallow, the weak liquor is pumped from under the soap, and fresh lye is put in its stead; this is boiled as before till the soap exhibits certain appearances well known to the maker; it is then cooled down, and poured into deep wooden frames, fifteen inches wide and forty-five inches long, where it lies until it is hard enough to cut up into bars for sale. In making yellow soap, resin is used in about



one part to three or four parts of tallow; common fish oil is also used to make yellow soap. In making soft soap, potash is the alkali made use of in boiling in the copper with the oil, and when a complete union of the materials is formed, the whole is poured into small casks for sale.—Parkes's "Chemical Catechism."

Potash had its name from burning vegetables in iron pots to make it.

A soap-boiler's shop with soap in it was discovered in the city of Pompeii, overwhelmed by Vesuvius, A. D. 79. Most of the people in the Shetland Islands, the Highlands of Scotland, and the coast in different parts of Ireland, are supported by collecting seaweeds, and burning them into kelp. Sal Soda got its name from a plant which grows on the Spanish coast, and which is burnt for its preparation and sale.

*Cleansing and Spiriting New Piece Silk Goods, Garments, China Crape Shawls, and other Manufactured Silks for Re-dyeing and Dressing.*

In describing how the work is to be cleansed and dyed, I imagine myself in the Dye-house, giving orders to the men under me how to do it properly. My long experience and constant practice give me confidence, and I actually fancy I am performing the work, whilst writing down how it should be done.

Get the big copper on to a boil with pure clean water. Have your mottled soap or Field's palm oil soap melted the night before. Get your three copper kettles on stands under the pegs. Put in each copper kettle three pails of boiling water and two copper bowls full of your melted soap. No soda ought to be used.

Take your silks into the Dye-house, put them on a board and sort them. Take the whites and pale blues first; next the pinks. Pass these through the three soap liquors in the kettles, one after the other. When these silks are folded up on a puncher, give them to your workmen to scour over the board both sides with a silk

brush. While they are cleansing the silks over the board you must continue at the copper kettle with the next lightest silks, to get them ready for the men at the scouring-board to go on cleansing, until all the silks are cleansed and ready for a very gentle boil in a clean, thin, melted, hard-curd, or Field's palm soap liquor. The men at the board must keep the silks they are cleansing apart. You must see that that is attended to, as the different colors, lying together, will stain one another. Your copper must be very clean, filled with clean water, and quite boiling before you begin to boil off your work.

Have clean round sticks made for this purpose only; they are called boiling-off sticks, and must not be used for anything else. They are about four feet six inches long, and made of beech.

I now come to sort the work on the horse, taking the white, pale blues, and pinks first into the boil. They must be well opened before they are put in the copper, and gently pushed down and kept under the liquor with the sticks, and not allowed to rest on the sides or bottom of the copper, nor left until they are done, which will be in ten minutes; not longer, as that is time enough to give them to boil in the soap liquor.

Have one of the punching-tubs half full of clean warm water with melted soap in it, so as to make a thin soap liquor of it. Put one of your punchers on it. Take your silk-sticks, put them under your silks in the copper, lift them all out at once into your thin soap liquor in the punching-tub, put them under the liquor and leave them for the present, and get your next lightest lot into the boil. Put them under the liquor and stir them occasionally while you are folding up those that are in the thin liquor on the puncher-head. When your first boil is folded up, hang them on one of the pegs in the wall which I have before described in my plan of the Dye-house.

Get up the second lot of silks that are in the boil into the thin soap liquor. Get another lot into the



copper. Fold up on puncher-head out of the thin liquor. Put these on another clean peg in the wall. Keep your eye on your men, and so on, until all your silks are boiled off and on the pegs.

*Rinsing out the Soap is the next Process.*

Cleanse your Dye-house board, tubs, kettles, and spare pegs free from soap. Have three punching-tubs full of clean warm water, and a puncher on each tub. Begin with your first boil in the first water, fold up on puncher-head out of this, and so go on until you have given them the three waters and put them on a clean peg. Proceed with the rest of your silks until they have gone through the three waters, and are cleanly and safely on the pegs.

*The next Process is Spiriting.*

Scour out the big copper kettle, and dry it. Put a small tea-cupful of neat oil of vitriol into it, and five or six pailfuls of boiling water on it. Have a clean stick, and begin spiriting your first boil of silks; open them well, put them one by one in the kettle, push them down with your spirit-stick; handle them for five minutes, fold up, rinse in two clean cold waters, put them on the horse to drain, and proceed in like manner with the rest until they are all spirited.

*Now proceed to Sort your Work for Dyeing.*

Every article the shopwoman takes from the customer is booked in the day-book, with the name of the owner, the color that it is to be dyed, and a number in the book. A corresponding number is fastened on one corner of the work with a needle and thread, so that it cannot be removed in cleaning and dyeing. This book is brought into the Dye-house; the Dyer takes the job and calls out the number, the book-keeper reads the entry and

tells him the color it is to be dyed. He puts it on a peg, and so he goes on calling out the number, and the person calling out the color, until all are sorted, each color by itself on one peg. In Liverpool the dyers have bits of flat wood, with the name of the color cut out on it. This bit of wood is tied to each job; which saves the time of sorting. Other places have a number for each color painted on a board, and hung up in the Dye-house; this number is put under the customer's number on the job. This last is the most handy and useful way of telling what color the job is for, and saves time.

The master, or foreman, begins to dye the work, giving a color to each man; he generally takes the light colors himself. Where there are many men in the Dye-house, it is a curious fact that some have a liking for dyeing certain colors. It is the duty of the master or foreman to study that taste, and give the workman a color to dye that he fancies. Sometimes a man is for years kept at one sort of work in cleaning and dyeing; and I have always found it dangerous to take him from it and send him to that sort of work in the Dye-house he is not in the habit of doing.

*To Cleanse and Spirit New Piece Silk Goods, Garments, and other Manufactured Goods for Dyeing and Finishing, without Boiling off in Soap.*

They are to go through the very same process, from first to last, as the silks have had that were boiled off in soap. I say, from nearly forty years' experience, there is no necessity to boil off manufactured silks in soap; the boiling off they have in taking the gum out of them is quite enough in all conscience, though some master dyers will have them boiled off, as they think it is best.

Men differ as much as in their faces;  
What one man likes, another man disgraces.

Notwithstanding this, I must insist on it, that the boiling off which manufactured silk gets while in the hands of

the skein dyer is enough for the remainder of its existence.

I must request the reader, to save repetition, to go back to page 45, line 17. He will see I have my silks cleansed on the horse, sorting them for the boiling off, and taking the whites, pinks, and pale blues first into the boil.

Now, my way is not to boil them, but to have the big copper kettle on a stand, well cleaned out and filled with scalding water made into a thin soap liquor. I then sort the silks that are on the horse ready cleansed, taking the whites and pale blues into the kettle first; handle them for five minutes with a clean stick; fold them up on a clean puncher-head, and spirit them directly, without rinsing out of the soap; that is, put your silks, while the soap is fat in them, directly into the scalding-hot spirits, give them five minutes' good handling in this spirit, fold them up on a clean peg, and give them two clean cold waters; fold them up on a puncher-head, wring them up in a wringing-sheet, smooth them down with your hands, and hang them up in a warm stove-room to dry. When dry take your silks down, fold them with the numbers outside, and take them into the shop to be sorted. The person who sorts them will write on a piece of paper the color each lot is wanted, will fold them in lots, pin the paper with the color written on it, and throw the lot into the drawer called the undyed silk drawer, leaving it there until you are ready to dye it; and so on with every lot of silks you have to clean and spirit, until you have them safe in your undyed drawer in the shop. There is no danger of their being stained this way. The reader will see the author's intent in thus cleansing and spiriting his silks. In the first place, the silk is not thinned, or harassed with boiling in soap, and it saves the boiling-off soap copper; secondly, there are three warm waters saved, and the time the man would be passing the silks through them. In passing the silks out of the strong soap into the spirits, it should be done quickly, while



the soap is fat in them; turning the soap in the silks directly into grease evenly over the whole job. Then, this grease from the soap and spirits combined is dried in them, which nourishes the silk, and attracts the coloring matter when dyeing.

Here is a case to prove that spirits turn soap into grease; wash your hands in soap, and pass them through spirits; your hands are no longer soapy; they are regularly greasy all over. Silk is an animal substance, so is the skin; and what will act on one will act in the same way on the other, so far at least as soap and spirits are concerned.

*To Dye Pale, or Sky Blue, and Whites.*

Having all your silks ready for dyeing, cleansed, spirited, &c., you must take the *Whites* first. It is needless to go through the different processes of dyeing them twice, as I gave ample directions how to dye them when I finished boiling the gum out of the skein silk, in pages 36 and 37. I have before observed that the same dye-stuff which is used for the new work will also be required for the old; there is no difference. If there is any difference the skein-silk dyer has it; for his work takes the dye directly and regularly on account of its softness; whereas the dyer of manufactured fabrics has the hardness of the silk to contend with, and often through rowiness and being uneven he has to dye it again, a loss the skein dyer seldom has to complain of.

*To Dye Sky-Blue in Silks with pure neat Saxon Blue,  
dissolved in warm water.*

Take half a pint of neat Saxon blue, put it in a jar, and scald it in two quarts of water; keep it well stirred while you are scalding it; put it by to settle down; scour your kettle and dry it; fill it with pure spring water, melt some ground alum into it until it becomes a curdy white. Handle your silks in this spring water and alum for

about ten minutes, and take them up on your peg. Have a half-pint stone mug at your service, and fill it with your scalded blue; pour half this half-pint of blue into the kettle; stir it well, and put your work back into the now blue liquor. Keep your silks handled in this for ten minutes, and look at your pattern. If not dark enough, get them up and give them more blue, and so go on until you have the proper color. Then give your silks two clean waters with very little sour in them, wring up, shake out well, and hang up in a warm room to dry. When dry, take them down, damp, brush, and finish them.

*Another way to Dye Sky-Blue in Silks, with Saxon Blue drawn off a Blanket.*

Scald your Saxon blue in a jar; get a piece of blanket about a yard long and half a yard wide. Put the blue with the blanket into a small kettle to swim in the copper; and when all the blue is absorbed by the blanket get it out to drain, and throw the blue that is left in the kettle into the old green liquor. (See page 19, Slate Cistern for old green liquor.) Give the blanket three clean cold waters, and put a pinch of soda in a pail of clean hot water, and put the kettle to swim again in the copper until you draw off all the blue of the blanket into the liquor. Get the kettle out of the copper; put the blanket to drain, and put tartaric acid or common sour in it until you make it barely taste of acid. Turn this carefully into a jar. Get a kettle of pure spring water, and put alum to it until it whitens; put your silks in, give them ten minutes; get them up and give them some of this blanket blue. Look to your pattern; if not full enough, get them up and give them more until they are done. When done, give your work one clean cold water with very little sour in it. Wring, fold, and hang up in a warm stove-room. Take them down, damp them in clean damp sheets, brush and finish them; if they are silk dresses they must be framed. (See description of a



Silk Finishing Frame, page 28.) If your silks are new pieces or shawls, they must be finished on the rolls. These rolls are very like the winch in page 23, only the rolls are solid round pieces of wood. There are two of them, and the silk is rolled from one to the other over a charcoal fire, the silk being wetted with size.

*Another way to Dye Sky or Pale Blue Silks with Paste Blue.*

Clean out your copper kettle, and fill it with clean soft water. Melt some alum in it, dissolve some paste blue in a pint stone mug; stir it well while you are pouring the water on it; put a little tartaric acid in to make it only taste; put one-fourth of the blue in the mug into the alum and water in the kettle. Open out your silks and put them in the blue liquor in the kettle. Give them about five minutes in this. Get them up on your peg, and give them as much more blue. Give them another five minutes. Now look to your pattern and see if you want more blue. If you do—give it, and so go on gently until you have the color you require, or more properly speaking, the color of the pattern the customer requires. When you have done, fold up your silks on the peg. Throw away the blue liquor, rinse the kettle, and give your work one clean water with very little common sour in it; fold up on the peg and wring your silks up in a clean coarse linen sheet about a yard and a half long. Fold them nicely, and hang them up to dry in a warm stove-room. When dry, damp, brush, frame, or roll them. Paper them, and they are finished.

*Description of Kettle Pegs.*

In dyeing these blues I have mentioned pegs many times. I will now describe them. I put a kettle on a stand near the light and wall. Just over the kettle I have a small round beech stick, well fastened with cement in the wall. The round end that is out I will in future

call the kettle peg. I have many of these kettle pegs round my Dye-house, and have earthenware pipes to sheath them when I don't like to trust my work to the bare pegs. They are two feet out of the wall in my description of the Dye-house, which you will see in page 17. It says, speaking of pegs, there is to be no horse or stand on the floor of the Dye-house. It is under these larger pegs that the little pegs are to be fastened into the wall.

*Another Way to Dye Pale Blue Silks with Nitrate of Iron and Prussiate, either Red or Yellow Prussiate.*

Fill your kettle with clean soft water; make it taste with a little oil of vitriol to four pails of water. Put in less than half a pint of pure nitrate of iron. Open your silks and handle them in this liquor ten minutes; get them up, rinse them in one clean cold water, with a little sour in it. Put them on your peg to drain.

Fill another clean copper kettle with clean water, and melt a quarter of a pound of prussiate in a pint brownware mug, and put it in the water in the second kettle. Take your silks that have had the nitrate of iron into the prussiate kettle and handle them well for ten minutes. Get them up on a peg, and give them one cold clean water; fold up out of this, and return them into the nitrate of iron, and give them ten minutes. Get them up and rinse again in one water with sour in it. Put them back in the prussiate kettle; give them ten minutes' rinse, and put back in the iron. Give five or ten minutes in this, and fold up on your peg. Throw away the iron and prussiate; give your silks two cold clean waters, with a little spirit in each, fold up on kettle peg, wring up and fold nicely. Hang up in hot drying-room, and, when dry, take down, damp, brush, and finish.

*Remarks on the four preceding Pale Blues.*

You can dye any blue you like, down to a dark pale blue and Waterloo blue. By adding more blue to the

same liquor, you can dye half-a-dozen different shades in the same copper kettle, exactly in the same way the pale blues are dyed. Dyers must make use of their brains more than any class of tradesmen I know of. I generally like to give my blues three dry sheets before I hang them up. It is a sure and safe way of getting them up. You must use the sheets one after the other; fold them after this, and they will do to damp the silks when dry.

*To Dye Silk Waterloo Blue and Lavender, French White, and Peach.*

Fill the small copper with clean water. Make it boil, and put half a pint of pure red or blue orchil in it, with a pinch of soda. Make a thin liquor of it, with melted hard soap; damp the fire so that your copper will not boil, but simmer. Put in your French whites first; give them a quarter of an hour; have a thin soap liquor to put your silks in when taken out of the copper. Have a man with two warm rinsing waters to take the work from you. If you think your French whites too full, get them out on your stick—do not let them off of it—and add a little more melted soap, and put them back in the copper; that will soon reduce them. Get up your silks out of the copper into the thin liquor; fold them up and give them to the man at the warm waters to put your French whites through, and hang up in a warm room. Damp, brush, &c., and the French whites are finished.

*Peach Color in the French White Copper.*

Add another half pint of orchil to this copper, and dye your peaches in it. Put them in your thin liquor, fold them up, and give them to your man at the rinsing waters, and finish as in the French white. Some Dyers prefer cudbear for this work—there are two ways of using cudbear, one way is to put as much cudbear as you want in a small pipkin and boil it, and strain what you want into the copper; the next method is to put the



cudbear in a fine muslin, tie it up and boil what color you want out of it; then take it out of the copper and put your work in to dye.

*Waterloo Blue in the Orchil Copper.*

You must now see if there is enough orchil or cudbear after your peaches to dye your Waterloo blue; if not, put in more. Get your work opened and put it in the copper, and give it about a quarter of an hour. Put it through the thin liquor, and give it to the man to put on the peg. It is now ready for blueing, when a man can be spared to go to the kettle to blue it, in a good strong Saxon blue liquor, and rinse it in two clean cold waters, with a little sour in each water; wring and hang up to dry. Add a little more soap to your copper orchil, and body your lavenders in it; do the same with them as the Waterloo blues, and put them on the peg to blue. The lavender is not to be blued in the Waterloo blue liquor, it must be put in the green liquor, the kettle cleaned, and the lavender blued in spring water, with a little scalded Saxon blue in it. Under the head of puce and crimson vats, I will give directions to dye the above colors in a different way. This work must be sheeted up dry, in clean cotton or linen sheets. It is the safest method.

*To Dye French Blue with Nitrate of Iron and Red Prussiate.*

1st. Get eight ounces of crystals of tin, one pint of nitrate of iron, half a quartern of oil of vitriol, and ten gallons of clean cold water. Put half the vitriol in the water first, then the crystals of tin, and then the nitrate of iron. Before you put in your liquor the crystals of tin, you must get a pint stone mug and put in it a quartern of oil of vitriol. Put half a pint of cold water on the vitriol in your mug. Have the crystals of tin in one hand and a bit of clean stick in the other hand, and directly you put the cold water on the vitriol, put in the



crystals of tin after it; stir with a stick for half a minute, and then add it to the liquor. This is the mordant for French blue, and it is ready for use. Now open out your work and handle it in this liquor for ten minutes; rinse it from this in two waters, with common sour in them, and put them on a peg to drain for the prussiate.

2d. Melt four ounces of red prussiate in a quart stone mug, and put it in a clean kettle, with six gallons of warm water. Let your silks be handled in this ten minutes. Rinse them from this in two waters with a little sour in them, and return them into your mordant again. Rinse in a spirit water and return in your prussiate, and so go on quietly for four or five returns in the mordant, and the same in the prussiate; and when you have your silks the French blue you require, rinse them out of the mordant in two clean cold waters, with a little spirit in them, wring them in a cloth, shake them out well, and fold and hang them up to dry in a hot stove-room. When dry, damp, brush, and finish. Before I begin to dye these blues, I always look after my shawl sheets, to see they are dry and ready for use; and when my blues are dyed, I make it a rule to sheet them up dry, and brush them without hanging up, fold them, and put them in a cloth in the unfinished drawer in the shop. See that they are dry before you put them in the drawer.

REMARKS.—I prefer six wets to three, because the silks are evener and brighter. Suppose it will take me two hours to give them three wets, I will only take two hours to give them six wets, so I lose no time in doing so. I make up my preparation and prussiate liquor the night before I want to use them in two separate vessels, and turn the top of the liquor over in two clean kettles in the morning, and begin dyeing a clear preparation and a clear prussiate liquor. I prefer this way; it is best to let them settle down.

These two liquors may be saved in two very large stone jars, and helped with fresh dye stuff every time after they are used. My two jars are placed on stands, and

when I am going to dye French blues, I put my kettles under the stands and pour my liquors gently into them, and when I have done help them with fresh dye-stuff and fill my jars.

*Another Way to Dye Silk a Prussian Blue.*

Clean a copper kettle ; and to four pails of water add—1st, a teaspoonful of oil of vitriol and one pint of nitrate of iron. Put your work through this for ten minutes, fold up on peg, rinse in two waters, fold up, put your work on a peg to drain. Clean a copper kettle, and melt a quarter of a pound of yellow prussiate of potash in a quart stone mug, melt it in scalding water, fill your kettle with clean warm water, and pour the prussiate into it. See that all your prussiate is melted. Give your work a quarter of an hour in this liquor. Return it into the nitrate of iron without rinsing it out of the prussiate. Give it ten minutes in the iron ; get up, rinse, and return in the prussiate again for four times, perhaps five times, until you have your proper color. Rinse them in two waters out of the nitrate of iron, wring, and sheet up ; dry-brush and finish. This is the way they were done for years before the crystals of tin and red prussiate were introduced.

*Third Way to Dye Silk Prussian Blue, with Peach Body First.*

The reader must be aware that I am giving receipts for dyeing these silks when they have been cleaned and spirited.

Have a clean kettle, pour two pails of pure, clean water into it ; add one tablespoonful of oil of vitriol to that and one quart of puce spirits ; after this add half a pint of the puce vat liquor. Stir it well, and handle your silks in this liquor until they are a peach color. Get them up and give them one cold water ; fold them up and dye them Prussian blue, either the first or second way I have given receipts for as above. Both

ways are good, but the first is the newest and cheapest; because when you have dyed your silks you must save your liquors. It would be waste to throw them away, as they will do well a dozen times, with a little help every time they are put by. The liquor they were peached in must be saved in a stone vessel. It will last a long time if helped.

In 1748 Monsieur Macqueer, of the Royal Academy of Sciences in Paris, discovered a method of dyeing silk and cloth Prussian blue superior to any indigo with nitrate of iron, muriatic acid, and prussiate of potash.

Having now finished with blues on silk, perhaps a short account of the Indigo plant may not be uninteresting to my readers, especially as they have heard so much of Saxon blue in my instructions how to dye the pale blues, waterloo blues, blue whites, and lavenders.

### *Royal Blue.*

Prepare in a solution of nitrate of iron 3° Twaddell, 100° Fahrenheit, and for every pound of prussiate used in dyeing add as much of the crystals of tin (*dissolved in hot water*) to the preparation, work in this till the silk turns a light buff color; lift, and wash in one water. After which—

For 100 yards dissolve four pounds of prussiate of potash in a little boiling water, put this into a copper containing eighty gallons of water, 120° Fahrenheit, add one and a half gills of sulphuric acid or muriatic acid, enter in this winch fifteen minutes, lift one water, run again through preparation, add two gills of sulphuric acid to the prussiate, repeat in it if not dark enough, and add a little nitrate of iron, after getting it to the required shade, give two waters, then harden in a solution of alum and dry in a hot stove.—From Thompson's "Practical Dyer's Assistant," p. 16.

*Preparation of Iron and Tin as a Mordant for Royal or Prussian Blue for Silk.*

This is not prepared to stand in reserve, but only when about to be used. The iron used for this color should be well killed. That is, the acid should be well saturated with iron, and produce a solution of a deep dark red. Some dyers add a little muriatic acid to the iron when it is to be used along with the tin; the crystals of tin should be added to the iron liquor immediately before entering the goods, and the liquor should be well stirred to prevent inequality.—From Napier's 'Manual of Dyeing,' p. 234.

*The History and Description of the Indigo Plant.*

In the province of Saint Salvador, South America, a country famous for the production of dye-stuffs, grows spontaneously the plant Giquilite, the dregs of which are called

*Indigo.*

The mode of preparing it is by steeping it in water, as follows: There are three open troughs or cisterns raised a distance from the ground, one over the other, so as the topmost vessel will, by means of a hose, empty itself into the one beneath, and from that to the undermost cistern. The top cistern is now filled with clean water, and the plant is cut the same way as we do our heath broom, which it nearly resembles, and thrown as cut into the top cistern with the clean water in it.

It is left in this cistern about two days. By that time it will have become incorporated with the water, and smell alarmingly as it is becoming decayed. Now the water becomes heated, and ferments and bubbles. It is working fast now. Every bubble bursts with a gaseous smell. The top of the liquor becomes purply. It must be watched now, for the fermentation is at its height.



At this stage it must be well raked from the bottom, and the hose untied and let run into the vessel under it. In this vessel it is again well raked, and beaten with pieces of wood like a cricket-bat. The men must not stop until the indigo separates itself from the water, and the water becomes clear again; all this time the dregs of the plant are being precipitated to the bottom of the cistern, and are becoming what is called Indigo. Again it is well raked, and the hose untied and let run into the third vessel under it. In this vessel it remains one day to settle, and the hose of this cistern is untied, and the water let run off. The residuum of this liquor is indigo; and while it is wet it is made into lumps, dried with care, and sent to the indigo factor for sale. In some countries they boil the third liquor in a copper, until the liquor becomes like thick blood, then it is poured into a flat wooden cooler, like a brewer's, or a billiard table, with holes in the corners to let the water pass through gauze wire, and the grounds that are left in the cooler is pure indigo, and is now as thick as paste, and as in brick-making, when dry enough, is cut into lumps, and these lumps are placed on shelves in a drying room made for the purpose, and when dry they are ready for sale. It is in this last process that the adulteration of the indigo commences.

This plant or shrub never grows more than three feet high. It nearly resembles our heath broom in its seeds and branches, and its small leaves are a blue green; it is sown in the middle of summer, and cut down about Christmas. The steeping in water commences directly it is cut. The plant is a triennial, and produces three sorts of indigo. That of the first year, while it is young and full of sap, is very coarse and heavy, of a brownish cast, and nearly all falls to the bottom in water. The more it sinks in the water the worse the indigo is.

When it is two years old it is in its full growth and bloom, and yields the best Spanish indigo, of a purple cast, and floats in water like a cork, and if rubbed with any hard smooth substance becomes bronzy.

The third and last year of its existence it yields very inferior indigo, even much worse than the first year, and then dies root and branch, all except the seeds. Of course they are always cultivating the plant to keep up the supply.

There are many other countries that produce indigo. I will give the names and prices in my list of dyeing drugs.

### *Remarks on Indigo in its Pure State.*

This drug will not give any color to water, and will not dissolve in it; it must be dissolved by an acid or an alkali. (See Blue Vat.) Dissolved in neat oil of vitriol it becomes Saxon blue, and by this process fit to dye different blues without any previous preparation, and the prettiest of light blues in silks, cottons, and woollens, from a pale blue downwards; also, with or without a preparation, greens on silk, cotton, and wool, with different sorts of yellow dye-stuff.

### *Directions to make Saxon Blue.*

Clean and dry a stone jar like a pickle jar, that will hold three quarts. Get one pound of the best ground Spanish indigo, and eight pounds of the very best oil of vitriol, and a brass rod like a stair-rod, about eighteen inches long. Put the whole pound of indigo into the dry jar at once (not a little at a time, but all at once), then pour in the jar, on the top of the indigo, the whole eight pounds of oil of vitriol, and begin stirring directly; do not leave it. After ten minutes' stirring, it will begin to work. Do not mind that, keep on stirring, it will soon subside. Be sure to put nothing else in it. In about an hour fermentation will cease, keep stirring it still until it gets smooth. The vapor leaves the jar, and when you can see your liquor it is dark blue. Now you may leave it; choose a clean warm place in which to put it. Cover it over, for the oil of vitriol will suck in

the damp air, and spoil the color. It must be nursed by heat for a couple of days, stirred occasionally, and is then ready for use. Some dyers put in the spirits first; others put all the spirits in the jar first, and then a table-spoonful of indigo at a time, well mixing it as they put it in. It is an old way, but a very good one.

I have thus simplified the making Saxon blue by only one pound of indigo; the reader can make one ounce or fifty pounds by taking this as his standard. The author begs to recommend the best dye-stuffs as the cheapest; they go further, and make the best colors.

*To make an Indigo Vat to Dye Silks Royal Purple.*

A vessel for an indigo vat is made of copper, about five feet six inches high and two feet six inches in diameter. There should be a round hole made in the ground about two feet deep, near a chimney, and a flag stone laid at the bottom of this hole, and the bottom of the copper vat laid on it. The earth is now thrown round it, and made level with the floor of the Dye-house; the vat is now standing upright, and is to be regularly set by a bricklayer, with copper door, bars, four inch flues, and stopper, and is connected with the chimney. As the fire will be not much used, this vat might be a distance off, out of the way.

Take a peck of bran and wash the flour out of it, and put it in a sieve to drain on a stand, in a clean place in the Dye-house, out of the way. Take one pound of the best madder and four pounds of pearlash, put them together in a small copper of clean water, and boil them well for twenty minutes, stirring well with a clean stick all the time; draw the copper fire, shut the door, put the lid on, and leave it for a while.

Get on a small copper with clean water, and fill it to within two pails of the top. Put in it one pound of pearlash and five pounds of indigo. Boil this for an hour, never leaving it, but well stirring it with a clean stick.



When the hour is up, draw the copper fire, leave the door open, and fill the copper with cold water, and leave it for a while. See that your vat is clean and wiped out dry. Turn the bran that is in the sieve into it, and place the sieve on two sticks across the vat, and empty the indigo and ash liquor out of the copper into it through the sieve. Keep the sieve still on your vat, and strain through it the liquor that is in the madder and ash copper; well rake the vat, and leave it to rest for a couple of hours. Keep it to the heat it is now by shifting a bit of fire into its fireplace. It has now a mottled yellow bluish-green appearance, with a bluish frothy top; now rake it again for five minutes, and leave it for half a day; the fire around it must be kept very gentle all the time. Boil up in a small copper in a small float of clean water a quarter of a pound of madder and one pound of pearlash, and put this in your vat, and rake well. When it settles, which it will do the next day, it is fit for use. After it has been used it must be helped with an eighth of the above materials, well raked, and used again when it is settled.

Dark royal blue must be bodied in orchil before they are vatted. Some blues are orchilled after they are dyed. Mazarine blue has a light crimson body made from cochineal on it before it gets the blue vat; it is then the fastest and finest of blues.

Some very dark royal blues, after they are vatted, get a mordant of blue stone and alum, are then well rinsed, and have a cold logwood liquor to darken them. The orchil copper is generally saved to run them through after they have had the logwood, as it cleanses and darkens them.

### *To Dye Silks Purple with Logwood.*

Take a copper kettle (a clean wooden vessel is better) that will hold six pails of water; fill it, and place it on a stand under a kettle peg. Put two pounds of ground alum and two ounces of bluestone, well melted first in the



small copper bowl or stone mug. Handle your silks in this for two hours ; they must not be left, as the copper will stain them if they are allowed to rest. When your time is up, get them on the peg, throw away your alum, and give them two rinsing waters ; fold them up and put them to drain on a peg, and they are ready for the logwood liquor.

Scour out well one of your tubs, and put six pails of clean cold water in it, and one bowl full of your boiled up logwood liquor ; open out your silks and handle them in this for half an hour. Get them up and give them another bowl full of logwood liquor. Give them another half hour in this. Get them up, and throw this liquor away. Make up a fresh one, the same as above, and give them the same time ; it *must* be done, for there is no getting out of it ; get them up again, rinse in cold water, wring and hang up.

*To Dye Pale Pink, Full Pink, and Blue Pink, Rose Color, and Scarlet with Safflower.*

Safflower, or bastard saffron, is the flower of a plant growing in the East Indies and Turkey. Bengal safflower is the best. It comes here in small compressed pats that require some days' soaking in water before they open themselves ; they cannot be stripped of their color until they are opened.

*Directions for Cleansing and taking the Color out of Safflower.*

Clean out a tub and put five pounds of safflower in it, rather more than half fill the tub with clean water and beat well with a stick, and leave it in some clean place. Beat it four or five times in the course of the day. Next morning have a clean sieve, put it on the ground, and with the copper bowl turn the safflower into it. Let the water run away, and when it is strained throw it back into the tub, and half fill it with cold water again ;

beat it well with the stick, and leave it. You must do this every day until it swells itself entirely out; when it does this it is ready for stripping for its color.

Put the sieve on the ground, and turn the safflower into it. Clean out a kettle, put it on a stand, and pour four pails of blood-warm water into it. Melt half a pound of pearlash in the water that is in the kettle, and throw the safflower from the sieve into it. Take your sticks and beat it well for a quarter of an hour; now place two sticks across the tub with a blanket stretched out. Then put your sieve on the sticks, and turn the safflower into the sieve; it will go through the blanket into the tub. Put four pails of warm water in your kettle again, and a quarter of a pound of ash; well drain the liquor out of the safflower that is in the sieve, and throw it back again into the tub, and mix it well in this liquor with your hands.

This process must be repeated three times, and the safflower may then be thrown away. Take your blanket off the tub, and melt a pound of tartaric acid in a stone quart mug with scalding water; put this into the extract of safflower very slowly, stirring it all the time; it will ferment a good deal while you are putting in the tartar, and if there is not enough you must put more in it, for it must taste well of it. If there is too much tartar in the liquor it will injure it; but it must taste of the tartar. Now get six yards of soft and thick Indian cotton, about a yard wide; tear it into yard lengths, put it in dry as it is in your extract of safflower, handle it well for five minutes, leave it, and go on with the dyeing the pinks the next morning.

Begin with the Blue Pink, as it will allow time for your sheets to be sucking in the safflower. Clean out a small copper, fill it up with boiling water out of the large copper, shift a bit of fire under it, and put as much red orchil into it as will make your silks a pale French white. Simmer them in this for a quarter of an hour; have a nice warm thin liquor of soap to throw them into, and fold them up on a puncher-head and give them a

common scour in clean cold water directly out of the soap liquor, and one cold water after the scour, and they are ready for the extract of safflower.

Now go to your tub where the sheets are, and take one of them and give it three or four cold waters; have a small clean kettle and put a pail of blood-warm water in it. Melt in a stone mug two ounces of pearlash, and put it in your warm water. Now put in your sheet to strip the color from it. Give it a little time until all the color is off, wring it out and throw it in the tub with the other sheets. Put a quarter of a pound of tartaric acid in this extract, and it is now, after all this trouble, fit to dye the pinks. I never thought there was so much trouble until I had to describe it. Have a clean copper kettle, and put four pails of water in it. Place your kettle on a stand, and put all the extract you took off the sheet into it. No tartar is to be put in now; nothing but the clean water and the extract. Open out your silks and put in the blue pink, the pale pink, the full pink, the rose pink, and the rose color at once into it, and handle them well for twenty minutes. Have another clean kettle, and put one pail of warm water into it, and melt a quarter of a pound of tartaric acid in it, fold up your pale and blue pinks out of the kettle, and handle them for five minutes in this second kettle with the tartaric acid, and they are finished. Fold them up out of this, wring them in a clean sheet, first putting the sheet in the tartaric acid, and hang them up in a hot room, and they are ready for dressing.

Now there are two pinks done out of the five you began with, and three remain in your extract kettle. Fold them all up and handle them for five minutes in the tartaric acid; fold them up out of this, give them one clean cold water, and put them back in the extract kettle; give them twenty minutes in this and get up your full pinks. Put them through the tartaric acid, and wring, shake out well, and hang up in a warm room, and the full pinks are done. Now you have two left in your kettle. Get them up and pass them through the



tartaric acid, squeeze them out of it, and put them back in the extract kettle; lift this kettle now into a copper of boiling water to swim, so as to make your liquor that you are using too hot for your hands; get it out directly, and take your rose pink up, and put it through your tartaric acid kettle, and it is done. Do not leave it until you hang it up to dry. The last of the five is the rose color. Get this up on the peg, and melt a little tartaric acid, and put it in the extract kettle. Put your rose color back into the extract kettle, and it will suck up what safflower is left in the liquor, and that will finish the five different pinks, and all done in one liquor by a little manœuvring. These liquors are worked out and must be thrown away.

The scarlet that is done with safflower must be well boiled with annatto first; it is then dyed scarlet with the extract of safflower taken off the sheets and put on the silks exactly the same way as the pinks were dyed, but must have fresh sheets. It is a very expensive way of dyeing scarlet; there are other ways of dyeing scarlet on silk, viz., by cochineal, brazil, and the crimson vat. But dye scarlet on silk as you will, it must have a strong body of annatto on it first.

The cotton pink sheets may lie in the tub for a couple of days; they must be handled occasionally, and then got up, rinsed, and get a tartar and water, and be hung up to dry. The dyer must be very careful of these pink sheets, as they cost a great deal of time and trouble to dye them. With the exception of the one that was stripped of its color to dye the pinks, the whole of the safflower is on them, and they are ready at any time to be stripped to dye pinks when wanted. In the slack time of the year we generally dye our pink sheets; they are, however, not so much used as formerly, as there is now a concentrated extract of safflower sold at the dry-salters. It is a very good article; the best I have used as yet is sold in pint and quart bottles, at the Messrs. Skilbeck's, Lower Thames street, at 16s. the quart bottle—the bottle holds a quart.



*To Dye Buff, Amber, Leghorn, Straw, Bird of Paradise, Orange, Cherry Color, and Scarlet with Annotto and Soap.*

Annotto is a vegetable paste that comes in its own leaves from South America. It is a self-color, requiring no preparation; it is very good for silk and cotton goods, but will not dye wool at all; it has the good quality of being a safe, cheap, and expeditious dye-stuff, never going uneven on the work. After you have given it to your silks they are ready to take any dye-stuff that is given them; it does not blind the silks, but, on the contrary, often makes a bad job a good one. Orchil has the same properties, but it is a very different color, and equally a godsend in many cases to the dyer.

When at work in the Dye-house, the master or foreman generally sets the men to the colors they are most accustomed to, and takes the annotto or orchil copper himself, and gives instruction to his assistant, who is generally an apprentice, to get the annotto copper ready, which he does by scouring it out and filling it with boiling water; putting two clean sticks on the copper. He then gets a thin soap liquor and two rinsing waters ready, and the foreman or master begins with the buffs first. The paste annotto has been previously well boiled in about a pailful of water and ash, and put by in a jar, when strained it is fit for use.

*Buff.* Put a little ash in a small copper, then a little soap, and about half a pint of annotto liquor; put in your silks and handle them well for a quarter of an hour; get them into the thin liquor, fold them up, wring them in a sheet, fold and shake, and give them to the man to hang in the drying-room.

*Amber.* Add very little, if any is required, more annotto to this liquor; look to your fire so as your copper may simmer, and put in your silks for amber; handle them well for a quarter of an hour; get them into the thin liquor, get them up, and give them to the man to

rinse, and yellow with weld or turmeric, or both together, and hang them up to dry when sheeted up.

*Leghorn* and *Straw* colors in this copper together require no addition of annotto, there being plenty left in the copper from the others; simmer these a quarter of an hour, and get them into the thin liquor, fold them up on puncherhead, and give them to the man to rinse. While the man is rinsing, make up a cold water in a kettle and put a bowl of fustic in it, telling the man that those silks are for Leghorn and straw colors, that he is to die them in the fustic kettle, and get them up in the drying-room. The straw colors require a little more color fustic than the Leghorn. You must attend to the fire; also put a little more soap and ash into your copper, and about half a pint of annotto; your man by this time is hanging up the Leghorns and straws.

*Bird of Paradise* is the next color. Open out your silks and put them in the copper, first putting in a little annotto, keeping them well handled for a quarter of an hour; get them into the thin soap liquor, give them to your man to rinse, and give them a liquor in the kettle of clean water, spirits, and fustic together; after that, give them a clean cold water, and hang them up to dry.

*Cherry Color.* Put a quart of the annotto liquor out of your annotto jar into your copper; then open your silks out and put them into it; give them twenty minutes in this; get them into the thin liquor, fold them up and give them to your man to rinse. While he is rinsing them you are to clean out a kettle and turn over some crimson vat in it. Tell your man to dye them cherry color in the crimson liquor, and give them two cold waters and hang them up. These must be sheeted up nearly dry, in a clean linen or cotton sheet.

*Scarlet* is next. This you must stuff with annotto. You must give it all the color that is left in your annotto jar; simmer your work for twenty minutes; get it up and put it in the thin liquor, fold up on the puncherhead, and give it to your man to pass through the crimson vat; rinse in two cold waters, and hang up in a

warm room to dry. Now that all these colors are dried and hung up, the cinnamon browns and vaunterines are to follow in the same copper. Fill your copper out of your thin soap liquor, look to your fire, keep your copper to a simmer, and put in it—

The *Vaunterines* and *Cinnamon Browns*, and handle them well for half an hour. Get them into your thin liquor, give them a clean cold water with sour in it, and a cold water after the sour; wring and hang up in a warm room to dry; and when this last lot is dry, put them with your silks for hair brown, and the pattern pinned to them.

Now I have done with the annotto copper. After dyeing and preparing *seven* different colors in it, it is still useful for dyeing buff cotton linings before it is thrown away.

Satin stripe and plain tabarets are to follow in the annotto copper. The scarlet silks are generally taken out of a warm thin soap liquor, and dried in a hot stove-room, and vatted when dry in the crimson vat.

Tabarets for amber must have a very weak annotto copper, and be yellowed with turmeric or weld. Turmeric is the best for old tabarets, which, when dyed and finished properly, look as well as new. They must be damped, brushed, and watered. Bavistock, Great Russell street, is as good a waterer as I could wish for; and Seagrave, in George yard, and Hall, in Archer street, are quite as good. But we all have our likings and prejudices.

### *To Dye Silks Poppy.*

When the silk has received the annotto, ground three shades less than for aurora, the safflower preparation must be ready, and turned by the solution of tartar, as before described, and the silk well washed from the annotto grounds, that the alkali of the pearlash used with the annotto may not counteract the tartar of the safflower. A bath of this safflower must be thus prepared for the silk as strong as it can be; the silk is then worked six or



seven times through it, and for a full poppy it is necessary to pass the silk through four or five such liquors. The poppy is the deepest color that can be done with the safflower. I have observed before that the liquors left from the poppy, if used directly, will serve for orange, cherry, flesh, &c.

Archil, as described for crimson, with cochineal for wool, as before directed, is to be used on some occasions, in other cases some patterns have no ground of annotto. —From Parker's 'Dyers' Guide,' page 112.

### *Saxon Greens on Silks.*

I shall begin with ebony, as the best yellow. First take a pailful of ground ebony, and two pounds of quercitron bark, boil it well for half an hour in six pails of water; clean out the large copper kettle, and put half a pound of turmeric at the bottom of it; put two sticks across the kettle and a sieve over them. When the half hour is up draw the fire, and run the ebony through the sieve on the turmeric. Do not disturb the sieve, but put in a stick and mix the turmeric with this first pail of ebony liquor. Now go on, and turn in the rest of the ebony liquor through the sieve: Save the ebony grounds, as they make splendid colors on green woollens. Put your kettle on a stand under a kettle peg, scald about half a pint of chemic blue, what we dyers call the Saxon blue, and put it handy to you. Get a handful of alum and throw it in your ebony kettle, and handle in the pea, pomona, and grass greens at once, altogether in this liquor; handle them well for half an hour, and fold them up on your peg. Sort them now, beginning with the palest greens. Put in as much blue as you may want for them; work to your pattern; and when they are done give them to your man to rinse in two clean waters, with a little spirits in each, and hang them up in a hot room to dry.

Put more blue in the liquor for the grass greens; work to your pattern; and when these are done rinse as before, wring, and hang up to dry in a warm room.



The myrtle green is next. Put into the liquor a saucerful of turmeric, and the remainder of the Saxon blue; put your silks in the liquor and handle them well; put your kettle to swim in the large copper, and keep handling them until it gets too hot for your hands. Now lift the kettle out of the copper, and put it on the stand under the peg, and you will find the work is dyed a good myrtle green. Rinse in three cold waters with sour in them, fold on the pegs, wring, and hang up to dry. This green liquor that you have used is not to be thrown away, but saved in a slate cistern; and when it is cold it will dye splendid grass greens in the following manner: When your silks are cleaned and spirited for grass green, open them out and handle them in the green liquor in the slate cistern, and leave them. Give them a turn when you are going to leave off work in the evening, and so turn them twice a day for three days, and they are dyed an even, clear, bright grass green. Rinse in three clean cold waters, with a little sour in each; wring in a sheet, and hang them up wide in a hot room to dry. All these greens require to be damped, brushed, and framed.

*Green with Alum and Weld.*

Green silks, dyed with weld, must be well alumed in clean cold water and ground alum that has been scalded in a copper bowl and turned into it. The silks must be well handled in over night, and got up in the morning and rinsed. The weld must be boiled with a little potash and strained through a sieve into a kettle. The silks should be well handled in it for half an hour, then folded upon a peg; and some Saxon blue having been scalded and a little of it put in the liquor, your silks must be put in and handled. Look to your pattern, and if they will do, get them up at once; rinse them in two clean cold waters, with very little sour in them, wring, and hang them up in a warm room to dry.

This way of dyeing green silks is a tedious and expen-

sive one. You can only dye the very pale greens with weld ; the grass and myrtle must be done with ebony or fustic, turmeric, and Saxon blue.

*Green on Silk for Parasols and Umbrellas.*

Green wanted for parasols must have the blue vat first, and then be alumed and welded. Some Dyers have a blue vat for fast greens only. When that is the case, they are first alumed, as hot as you can bare your hand in it ; rinse out of the alum, and get weld and fustic together boiling hot, well handle them in this ; get them up and vat in the blue vat to the color you want ; rinsed out of this, they must be put through the alum again, and given a little time ; then rinsed and put back again into the fustic and weld ; they must have a little time in this liquor also, and then got up and finished in a weld liquor with a little Saxon blue in it.

*Silk Dyed Green with Fustic, Alum, and Blue together.*

Take one pail of the best fustic chips and boil it in six pails of water, with a handful of ash, for half an hour. Have a clean cask that will hold twelve pails of water ; put the sieve over it, and strain the fustic into the tub ; throw the chips back again into the copper, and give them a good boil ; draw the fire, and strain through the sieve into the first boil ; this done, put into the liquor one pound of ground alum, and stir it well ; scald half a pint of Saxon blue in a stone mug or jar, put a half a pint of this into the fustic liquor, stir it well, and leave it to cool. When cooled enough, open out the silks that are for the pale greens down to the grass green and put *all* into this compound green liquor. Handle them well and leave them, but do not forget them ; they must be turned now and then throughout the day, left in the liquor a couple of days, and turned occasionally to keep the color regular. By this time some of the light greens will do, and given to your man to rinse, which must be in two

clean waters with a little sour in them ; then hang them up to dry in a hot room. You must put in another half-pint of blue in your green liquor for the grass greens, and put them back, watch them for another day, and when they have color enough take them up ; rinse, wring and hang them up to dry in a warm room.

Save this green liquor ; it will dye another lot of greens.

*Dark Greens, Invisible Greens, and Olives in Silk.*

These three colors must have a body on them of annatto, cudbear, or orchil. Any one of these three drugs will do, but one of them they must have before you begin to dye them. Take ebony and fustic chips, and a small copper bowl of logwood chips, and boil them together, in a copper that will hold eight pails, for half an hour. Draw the fire from under the copper and turn the boiled liquor into a copper kettle, with a pound of turmeric on the bottom of the dry kettle. After you have put in the first pail of liquor take a stick and mix the turmeric ; now put in the remainder of the boil through the sieve into the kettle. Put the kettle on a stand under a kettle peg and have a clean stick. Open out your silks and handle them for half an hour in this liquor, and then get them up on the peg and take the olives out and sort them. Put the greens on a peg away from your kettle, and in another kettle put some warm water ; melt a pound of copperas in your copperas pot, and stir it well into the kettle with warm water in it, and take your olives and handle them in this copperas liquor for a quarter of an hour ; fold them up out of this liquor and give them two clean cold waters, and put them back into the first kettle with the yellowing in it ; give them a quarter of an hour in this liquor ; fold, and give them two cold clean waters, and hang them up in a warm room, and they are a permanent and sound olive. Damp brush and frame for a finish.

The next is the dark green. Scald as much Saxon



blue as you may want, in a mug, and pour it in your first kettle with the yellow in it; handle the greens in this green liquor, and put your kettle to swim in the big copper. Keep on handling the work, and, when too hot for your hands, take it out, put it on a stand, get it up, and the dark greens are dyed. Put in more blue for your invisible greens, give them time enough to suck in the blue, and they are dyed. Rinse them in two clean cold waters with a little spirit in them, and hang them up in a warm room to dry. When dry, finish as usual.

*Drabs and Fawn Colors on Silk.*

Scald half a bowl of sumach, and, while it is scalding, scour out your big copper kettle and put six pails of warm water in it. When the sumach is settled down, put three bowls full of the liquor into your kettle, open out your fawns and drabs, and put a small teacupful of oil of vitriol in your sumach liquor; stir it well, and handle your silks in the liquor; give them half an hour, and fold them up on the peg; give them two clean cold waters, fold them up and throw the remains of your sumach kettle away; scour it out well, and fill it with clean cold water. Melt half a pound of green copperas in the copperas pot, and put it with your clean water in the kettle; open out your silks and handle them in it for a quarter of an hour, take them up and cool them, and rinse them in two cold waters. Throw away the saddening, and scour out the kettle; fill it up with clean water, and put half a gill of oil of vitriol into it, with a bowl of fustic liquor; handle them well in this for a quarter of an hour, get them up and sort them; the drabs may want reddening, which is done with warm water only, then rinse, and hang up in the stove-room.

The fawns are now to be finished. Nearly half fill your kettle with clean cold water, and put one pail of boiled-up fustic in it, and four pails of water and half a pint of orchil; put your kettle to swim in your boiling



hot copper, handle your silks for fawn in the kettle, and when you have got any of your silks the fawn you want, get it out and give it to your man to rinse and hang up. When your fawns are done, get the kettle out of the copper, fill up the copper, and look to the fire. The remains in the kettle may be thrown away. Rinse your work and hang it up to dry. Finish as usual.

There are many other ways of dyeing fawn and drab, but this way is the safest and simplest, as it is sure to succeed. Drabs and fawns are done also with spent puce and the crimson vats; with fustic or ebony liquor; and some dyers (especially those that dye for drapers and warehouse-men) have vats made with solution of tin for these colors only.

*Ruby, Marone, Claret, Hair-Brown, and Rappee on Silk.*

There are as many dye-stuffs used to dye browns as there are browns. There is cudbear, orchil, madder, redwood, peachwood, fustic, annatto, turmeric, French berries, copperas, nitrate of iron, and alum. Cudbear being the best of all, I will begin with it.

Clean out a small copper and get it to a boil, put in a bowl full of cudbear, well mixed before you put it in; get it to a boil, and then damp down your fire.

1st color. *Rubies*.—First open out your silks and handle them in copper over a clean stick, give them half an hour in it; have a clean little kettle well dried and put under a kettle peg, get your silks out of the cudbear copper and put them in this dry kettle, handle them in this until they are cooled, fold them on your peg, and tell your man to rinse these in three cold waters, wring them in the wringing sheet, and hang them up in the warm stove-room to dry, and they are done.

2d. *Marones*.—Handle your silk for twenty minutes in the cudbear copper, the rubies has left, then get them up and cool them in the kettle, fold up on a puncher and put a pound of turmeric into the cudbear copper—no addition of cudbear is requisite. Open out your silks and

put them in the copper, keep it under a boil, and handle them in this for half an hour ; get them up out of the copper into the cooling kettle, fold up, and give them to your man to rinse in three cold waters and hang up to dry. Damp, brush, and finish.

3d. *Clarets*.—No addition of dye-stuff is needed. Put your silks in the cudbear copper, give them a quarter of an hour, then place them in the cooling kettle. Have a kettle filled with clean water, melt half a pound of copperas in it, and handle your clarets in it for ten minutes ; fold them up, and give them two rinsing waters, and return them into the cudbear copper ; give them twenty minutes, and then get them into the cooling kettle ; fold, and give them to your man to rinse in three cold waters, and then hang up in a warm room to dry. Damp, dry, brush, and frame them.

4th. *Hair-Brown* is the next color in this copper. Give it now a pint of cudbear and half a small copper bowl of turmeric and two pails of fustic liquor. You must not use fustic chips, as they will eat up the cudbear. Open out your silks and put them in your copper, look to the copper fire and keep it up to a scald, handle your work and give it half an hour in the copper ; get it up into the cooling kettle and fold on the peg ; sadden the same as the claret, but stronger. Rinse it in two waters and return it into the cudbear copper, and give it twenty minutes ; get it up on your stick and cool it in your cooling kettle, fold it up on the peg, and give it to your man to rinse and hang up in the hot drying-room. Your next color is—

5th. *Dark Rappee*.—Your copper needs no further dye-stuff. Put your silks in the copper and handle them well for twenty minutes ; after that time get them up and cool them in the kettle, sadden them, rinse and return them into the cudbear ; give them twenty minutes in it, get them up and cool them in the kettle, fold on the peg, and sadden them again ; rinse and return them into the copper, give them twenty minutes, look to the fire and keep the copper nearly to a simmer ; get your

silks up and cool them, give them to your man to rinse and hang up in a warm drying-room. The next is the

6th. *Browns* that have had the *annotto copper*.—The copper wants helping with a little turmeric—no cudbear. Open out your silks and put them in your cudbear copper and give them half an hour in it ; look to your fire and shut the copper door ; when the time is up get them up out of the copper into your cooling kettle, fold them up on the peg, and give the silk for *cinnamon* to your man to rinse and take out of a weak sour, and hang up. You sadden the yellow brown and rinse it, and return it into the cudbear for twenty minutes ; get up, rinse, and hang up. Now the ruby, marone, claret, hair-brown, rappee, and the browns that have had the annotto have been done in one copper. Perhaps the dark browns will want saddening twice and second return in the copper, it all depends on the pattern—I always do it, it is no loss but the time—it is a better color and fills up the silk.

### *To Dye Silk Claret and Brown with Madder.*

Have iron hoops or filings, steeped in oil of vitriol and water always by you, in soak, the older it is the better. When you want to use it, take off the clear liquor, and be sure it is clean and clear, and handle your silks in it for an hour—do not leave them. Take them up and give them one cold water, and dry them in a warm room, and put your iron liquor back. Boil up as much madder as you may want for your work, strain it through a sieve, and if your silks are dry, begin the clarets first, those of no particular pattern will do nicely with madder only, those for darker shades will want a little logwood liquor, fustic, or turmeric in the madder liquor. Down to a hair-brown or rappee, the turmeric is the best to add to the madder. If the Dyer prefers fustic, he can boil up ground fustic with the madder.

REMARKS.—Do not wet the silks after they are dried out of the mordant, but put them dry into the madder liquor. The dyer ought always to have a person to wait



on him to rinse his work and hang it up to dry as fast as it is dyed; if he lets it lie on the pegs, or in the rinsing waters, it is almost sure to be spoiled. Let him have three warm or cold rinsing waters by him to rinse his work as he dyes it, and wring it up at once; it is shorter work to hang it up than to have to do the work over again. It is principally for want of pride, interest, and attention that the work has to be done over again—a man ought to be proud of being a safe and good workman;—a man of this description never wants work.

*To Dye Brown with Sanders, Fustic, and Oak Dust.*

Sanders or redwood, as well as fustic, comes to us from the West Indies, the oak dust is the production of England.

Take one pail of fustic, half a pail of oak dust and two pounds of sanders, boil them together and strain them through a sieve; put your silks in the liquor for an hour, well handling them; get them up, sadden them, rinse and return them in the dye-stuff; such as are not dark enough, sadden them again and return them, now rinse and hang up to dry; when dry these will want a great deal of brushing before they are finished.

*To Dye Different Sorts of Blacks on Silks a number of ways, all different.*

Black is a very troublesome color, and I am at liberty to think so, from the number of ways there are of dyeing it, and the many drugs that are used, although only three or four are really wanted. Most dyers consider they have the secret of dyeing the best blacks, and I may safely say in my time I have dyed blacks twenty different ways; but this I am certain of, that nicety in the handling, folding up out of liquors, care in hanging up to dry, and good finishing, are as essential adjuncts to produce good color, as the dye-stuffs themselves.



Black should be a full rich color, yet soft and brilliant. Dark blue is a good color to begin with.

*To Dye Silk Black with Nitrate of Iron and Soap.*

In page 19 you will see a description of a cistern to hold the black preparation; fill it up with clean water, and put a teacupful of oil of vitriol in it, stir it well, and put into it two quarts of nitrate of iron. Your silks having been well cleaned in soap, and spirited, open them out and handle them in your preparation; when all is in the preparation fold them up and put them back again without leaving them for a minute; put them under the liquor, and leave till night, then fold them up again, and put them back for the night; in the morning fold them up out of the preparation and dye them. Begin with giving them three clean separate cold waters, fold them up and put them on a peg to drain in the warmest part of your dye-house; clean out a copper and put in it one pail of logwood and one pail of fustic for each dress. For every twelve or fourteen yards of manufactured silk, have your mottled or oil soap melted, and make your logwood and fustic into a thin soap liquor—mind, it must not be a strong, only a thin, soap liquor, and too little soap blinds the work. Open out your silks across a black puncher, your man in the meantime getting a fire under your copper. Put your silks, with the cold dye-stuff, into the copper, not one by one, but throw them all in at once. Handle them for a quarter of an hour, put your puncher across the copper, and throw them up selvaige way, one by one, and when all are up on the puncher, put all back again; now look to your fire, and keep handling your work, taking it up and putting it back every ten minutes for one hour, and by that time it will have become too hot for your hands; you must now draw the fire, for when the heat begins to pinch your hands it is sure to begin to pinch the color off your silks, but it must come up to this heat before you can proceed further. When it has arrived at this

heat, throw up your silks on the black puncher, and put in your copper a quarter of an ounce of turmeric for every twelve or fourteen yards of silk; after the turmeric is put in, get in your silks, handle them well for half an hour, throwing them up once during that time, and they are done. Fold up your work smoothly on your puncher out of the copper, and put them on a peg to drain, give them a clean, warm, thin melted soap liquor, wring, and hang them up in a warm room to dry. Damp, brush, frame, or roll them, as they may require, and they are ready for the customer.

*To Dye Silk Black with Alum as a Mordant, when they have been regularly Cleaned in Soap and afterwards Spirited.*

Open out your silks and handle them in your alum preparation, leaving them in for a night or two, fold them up in the morning, rinse in two waters, dye them in log-wood, fustic, and soap, exactly in the same manner as the above. I dyed blue blacks this way twenty years ago, but did not then use any yellow, neither is it, I consider, required. I have tried it for jet blacks, and found it to answer remarkably well.

*To make Nitrate of Iron with Iron Filings.*

Get a large stoneware water-pitcher, and put ten pounds of nitric acid and three pounds of neat oil of vitriol in it, then add six pounds (adding half a pound at a time) of iron filings, which will cause it to work directly; place it in some fire-place, and watch it for a couple of hours, having a little cold water at hand to check it from running over, which it will do if not well watched. When it has cooled down leave it for two days, pour the liquor into a large stone bottle, with a stopper on it, and the day after it will be fit for use.

The best means you can adopt to have a clear nitrate of iron liquor, is not to allow your iron liquor to remain in the vessel you filled it in longer than twelve hours

after it ceases working, the bottoms after this goes back or ascends into or through the liquor and makes it thick, and this thickness is filth, and blinds the work; it can never be got out; even admitting there is attraction in it, is not loss of credit as a workman sufficient to countermand its use? I should think so. Nitric acid dissolves silver when applied with heat, and the liquor blackens the hair, makes marking-ink. Gold is no use in dyeing, it don't dissolve in any acid that is any service to us dyers.

*To make Iron Liquor with Acetic Acid and Nitric Acid.*

Get a large stoneware pitcher, and put twelve pounds of acetic acid, four pounds of nitric acid, and eight pounds of steel filings at once. Stir it well for one hour, and put the pitcher in a copper of clean water, and make the water boil, keeping stirred what is in the pitcher all the time. Damp your fire and leave it in the copper, stirring the iron liquor occasionally. This must be done for two days, when it will be fit for use. It must be emptied in to a stone jar, and a stopper put on it, and kept in a dry place, as all spirits must be, to prevent their losing strength by evaporation, and inhaling water from the air.

*To make Nitrate of Iron with Copperas, Iron Filings, and Tin Cuttings.*

Put in a large stoneware pitcher twenty-eight pounds of green copperas, fourteen pounds of aquafortis, three pounds of oil of vitriol, and two pounds of tin cuttings; the latter may be bought at the tinman's. Mix these altogether, and put by in a warm place for a day or two, and it will be fit for use. This, like the other two, must be shifted into a stone jar with a stopper.



*To Dye Silks Black without Cleaning in Soap.*

Soda them in a kettle on a stand in scalding hot water, put in the darkest, particularly those you suspect to have sal japonica, cutch or sumach on them, the light colors only to follow, so that they may suck up the soda and color that the dark ones leave in the kettle. When all your silks are put through the soda, and folded up on the peg to drain, throw away the soda out of your kettle, and spirit them.

Dry out the kettle, and put a teacupful of oil of vitriol, and six pails of boiling hot water into it. Now sort the silks for spiriting, taking the darkest first, get them up on the kettle peg, and put the light colors in the spirits, so that they may get stained with what color the darker ones may have left. Now they are ready for the mordant; rinse them in two clean cold waters and fold them up out of the last and open out your silks and handle them in your nitrate of iron cistern one after the other, and when all have been handled and put back into the preparation, leave them a night or two (two nights is best), fold them up next morning, and rinse them well in three separate waters; fold them up out of the waters, and put them on a peg to drain, and they are ready for dyeing black. Instead of using mottled or oil soap in your copper as you did in the two blacks in pages 80 and 81, you must change it and use soft soap only, or soft soap and neat's-foot oil amalgamated. Having thus prepared, you may proceed in the dyeing and getting them up in the manner before described. This work must be cleaned well after it is dyed in three good soap liquors and a thin liquor of soap, wrung up and dried directly in a warm room.

*Directions how to Amalgamate Soft Soap with Oil.*

Clean out a small copper kettle, dry it well, and put it to swim in a boiling copper. Put in it two pounds of soft soap, one pint of sweet oil or neat's-foot oil, and one



pound of soda. Beat these with a stick until they are all one body; have a pailful of warm soap liquor at hand, and put a bowlful of it in your kettle, still keeping it in the copper and stirring it all the time; then another bowlful until it is all in. Now take it out of the copper, and it is fit for use.

*To Dye Black Silks with Argol, Copperas, and Bluestone without Soap, in either Cleaning or Dyeing.*

Fill up your copper kettle with scalding water, and put as much soda in as you may require for your silks; pass them through this, fold them up and put them on the peg to drain; throw away the soda, and spirit them in boiling hot water in the kettle; well rinse them in three warm waters out of the spirits and fold them up to drain. Dissolve separately in hot water one pound of argol, four ounces of bluestone, and four pounds of copperas in twenty pails of water; handle your silks well in this liquor, and fold them up out of it two or three times, and leave them for a night. Get them up in the morning and rinse them in one cold water, fold and put them on a peg to drain, and they are ready for dyeing.

Clean out your big copper kettle and give them a warm liquor of logwood and fustic, and when this is worked up throw it away and give them another. Give your silks plenty of time in this second liquoring; get them up on the peg, and give them a very warm logwood and fustic liquor.

You do not give them a quarter as much dye-stuff in this liquor as you gave them in the other two. Fold up on the peg, and give your silks a clean warm water, and they are dyed. Hang them up in a warm drying-room, and when dry, damp, brush, and frame them. If these are not good blacks, certainly they would appear to be cheaply dyed; but that is a mistake, for they have taken as much time as the blacks dyed in soap, but have nothing of their brilliancy.

*Black Silks Dyed, as above, with Soap.*

There is no difference in cleaning and preparing of these to the above, but more is used, and logwood, fustic, and soap are worked together in the dyeing. They are good blacks—the soap improves them very much, and they finish up pretty well.

*To Dye Black Silks without Spiriting.*

Put a large copper kettle on a stand, and fill it with boiling water. Put in four pounds of salts of tartar, open out your silks and handle them over a stick, into the tartar. Put the dark colors in first, fold them up, and then put in the light ones. Fold them up on the peg to drain, and give them three separate rinsing waters; fold up on the peg, and handle them in the nitrate of iron preparation. Get them up, and return them directly into the iron liquor, and leave them for twelve or fourteen hours, turning them occasionally. Get them up out of the preparation, and dye them, first giving them two clean cold waters, and fold up. Now give your work a warm logwood and fustic liquor; when that is worked down throw it away; and give them another, and when that is done with give them for a finish a kettle of good logwood and soap liquor, as hot as you can bear your hands in it, wring them up out of this liquor, fold nicely, and hang in a hot room to dry. Damp, brush and finish them. Some dyers prefer Field's soap, some like the best mottled or oil soap, and others, again, prefer soft soap. Amalgamated is the best.

*To Dye Silks Fast Black.*

Dye them dark blue in the blue vat, as at page 61. Boil one pound of Roman nutgalls ground, four pounds of ground logwood, four pounds of ground ebony, four pounds of oak sawdust, and one pound of copperas, all mixed in a copper that will hold six pails. Boil these well for one

hour, filling up the copper with clean water as it boils down. Now draw the fire and turn over the liquor in a kettle, through a sieve. Put your silk through this liquor, fold, and cool it, and return it four times; rinse it well, and soften it with a warm liquor of soap and logwood; wring and hang up in a warm room to dry.

*To Dye Silks Fast Black with Prussiate.*

I must refer my reader to page 53, he will see there how to dye dark blue with the lavender vat, nitrate of iron, and red prussiate; he will see, as above, the drugs used to dye silks fast black; and the same drugs are used to finish off with as are used on the Prussian blue silks for black to jet them.

*To Dye Silk Velvets Black.*

Clean, spirit, and put them in the nitrate of iron preparation, well handle them in it, and let them lie for a day, handling them in it occasionally. Put up the velvet pegs (see page 22), and put your velvets over them, out of the mordant; rinse them in three clean waters, and put them on the pegs to drain. Clean out a copper and dye them with logwood, fustic, and soft soap with the oil in it. Give them a mottled soap liquor, and a thin soap liquor, to cleanse them from the dye. Put them on the velvet pegs to drain, and when drained sufficiently shake them out nearly dry. It requires two persons to shake them out, which should be done with the pile downwards, and then they should be hung up to dry in a hot room. When dry the velvets are to be finished in the frame. In dressing, the pile must not be touched with anything except the velvet brush, with a little fine oil on it. You must give them very little brushing, as it is expected that the shaking out will all but finish them. When on the frame they are to be evenly wetted on the wrong side with size and water, but care must be taken that nothing gets through the



velvet to the pile. When dry take your velvet-brush and gently brush the dust off, fold up with the face inwards, and they are done.

*To Clean and Dip Black Velvets.*

Clean out a kettle and put four pails of boiling hot water into it, and sufficient melted mottled soap to make a good strong soap liquor. Now add one pailful of logwood liquor to it and handle in your velvets, not with a stick but with your hands. Do not leave them, but give them twenty minutes, and they are done. Hang on the velvet pegs to drain, and when drained sufficiently, shake them well to raise the pile; hang them up to dry in a hot room, and frame them in the same manner as the dyed velvets.

*To Clean and Re-dye Silk Velvets that are a bad Black.*

Turn over into a kettle out of the logwood cistern, six pails of cold liquor, handle your velvets in this fifteen minutes only, take them up out of this liquor and put them across the velvet pegs; turn the logwood back into the bin, for it is fit to use again for any other work by adding a pinch of soda. Put half a pound of copperas into the kettle, and fill it with scalding water, and handle your velvets in it for ten minutes only; get them up on the velvet pegs, and rinse in one cold water, then a sour and water, and one water after; put them on the pegs, and give them a hot soda and water; put them on the pegs again, and clean both sides over the board with a velvet scouring-brush and gall; after the gall pass them through clean water, and put them on the pegs to drain, and when drained, to be well shaken, and finished by framing. This is a very good way because, 1st, the cold logwood is sucked on the velvets by the attraction that remained in them from the dyeing they had while in the skein; 2d, the copperas firmly binds the logwood on them; 3d, cleaning them in soda and gall, brightens



without thinning them as soap does. Done this way they look better after they have been worn for some time than they did when they first came from the dyer's hands.

*How to Renavate China Crape Shawls, Blond Lace, Black Silks, Watered and Plain, Black Satins and Velvets.*

As they are taken in the shop from the customer, being first properly marked and tacked, so you are to take them into the dye-house and place them on a dry board. Clean out the large copper kettle, and put in it two pounds of copperas and six pails of boiling water. Now sort your blacks on the board, and take the worst colors first; give them ten minutes only, fold up on the peg, and get in the rest; the velvets must be last and by themselves—mind that. Those that you sadden first, hang up to cool on the tenter-hooks in the dye-house; now get up those that are in the kettle and do the same with them; and lastly, the velvets, and give them ten minutes in the saddening; get them up on the velvet pegs to cool, and they are done so far. After this process give them two clean rinsing waters, fold them up on the peg and hang them up to dry. When dry, take them down and give them a strong scalding hot soap and logwood liquor together, as you sorted them before saddening; put in the lightest first, you must do the same now with them in the logwood and soap, give them half an hour in this, and see that the soap is strong in it; if it is, and your time up, get them on the peg, and throw the liquor away, and give them a clean thin soap liquor, and wring the silks and satins up, smooth down and shake the blonde, the shawls, and the velvets, and hang them up, and be sure it is in a warm room, to dry. Damp, brush, and frame your shawls, silks, and velvets, and give your silks for watering a weak sour and rinse, for silks never water well out of soap. The watered silks require damping and brushing before they are sent to the waterers as well as those for framing.

*Another way to Re-dye the above in a Black Silk Copper without previous Cleaning.*

The silks, crapes, shawls, blondes, and velvets are saddened, rinsed, and dried the night before I intend dyeing. When I have finished the latter, I take the articles that were saddened and dried over night, open them out and put them into the copper without any additional dye-stuff. Add, however, about a quart of soft soap and oil before putting the silks into the copper. I throw them up a couple of times before I leave them, and proceed with the cleaning of my black silks out of the dye-stuff, giving them a thin liquor; wring, fold, and hang them up in a very hot room. My man then takes the dippers up that are in the copper, and puts them through the soap liquor, the blacks left, and finishes them in the dye-house by giving them a nice hot thin liquor; wring, fold, and hang up to dry in a hot stove room. This is the cheapest and best way of renovating the dippers. I do not recommend giving the velvets this copper, but a clean logwood and soap liquor together, and a clean thin soap liquor after. Put them to drain, and well shake them out.

*To alter Black Silks that cannot be sent to be finished on account of being imperfect in the Dyeing.*

1st. The first and most usual way when they will not pass is to spirit them, and put them in the black preparation and dye them again, or wait until you have a fresh lot of blacks to dye; in that case they are put in the black silk hole.

2d. Place the kettle on a stand, put a pound of copperas in it, and fill with boiling water. Put the altered work through this saddening, rinse and dry, and give them the copper they are dyed in, if it is not thrown away; cold as it is, it will do, with a little addition of logwood. Let them lie in this liquor for a day or two, handling them three or four times. When you have a

couple of hot soap liquors to spare, get them into it, and hang them up. No alteration so cheap or so good as this.

*Another way to alter Dyed Black Silks.*

Put a kettle to swim in a boiling hot copper, and fill it with logwood liquor. When the logwood liquor is scalding hot lift it out and put it on a stand under a kettle peg, and handle your alteration silks in it. Give them only ten minutes in this (we have a clock in the dye-house, by which we time almost all the work we dye), and fold them up on the puncher peg. Put a handful of soda in the logwood liquor in the kettle, and turn it back into the cistern. Now put a little copperas into the kettle, and fill it up with boiling water; handle your silks in this for ten minutes; fold them up and rinse them one by one in one clean water, then a sour, then a clean water; then a small sharp soda in the bottom of a kettle, then a small warm water with a pinch of soda in it to soften it, wring up, fold up, and hang up in a hot room to dry, and they are done. When they are dry, if they are not as bright as you like, a hot soap liquor will make the alteration you require to the letter.

*To Dye Silks Black by first discharging the Color by Nitric Acid.*

Have a stoneware pan that will hold twelve gallons, with two arms projecting from the sides, let this float in a copper of boiling water, then put in it five pails of water and five quarts of raw aquafortis, and have a clean stick by you.

This spirit liquor must be as hot as your hands can bear it before you commence, it will very soon get hot in the copper. Some dyers have this pan inclosed in a vessel and heat it by a jet of steam. Have a clean stick and a board at hand.

Now take your silks; they are not to be cleaned nor



wetted, but dry. Lay them on the board, open them out, and take the darkest dress first. When you have opened it out put it into the spirit, and handle it carefully with the stick, and in less than five minutes all the color, dirt, and grease will disappear as if by magic. It will not be a white but a permanent buff color, which will improve with soap. Now take it out of this liquor and give it two clean cold waters, fold it up smooth on the puncher-head and put it on a peg to drain.

Now pass the remainder of your silks through, taking care you only do one at a time, never letting it out of your hands until it is discharged of its color and dirt, then rinse it, fold it, and put it along with the first silk on the peg, and when all the dark colored silks are passed through this spirit, the lavenders, blues, pinks, and whites are to follow; the object in doing this is to clean them and give them the permanent buff body.

Your silks are now spirited, rinsed, and on a peg ready for dyeing black. Have a vessel that will hold twelve pails of water, and first put in it a half a pint of oil of vitriol, and after that twelve pints of nitrate of iron, well stir this liquor and you are now beginning to prepare for dyeing throughout silk or satin dresses black, or 120 yards of any color, plain or figured silk, satin or China crapes.

Now open all your work on a puncher and put it in the nitrate of iron liquor at once, handle them well in it for ten minutes and throw up out of the liquor on the puncher over a tub and put them back in it, and so continue handling them for one hour; then fold them up on a puncher-head and give them three clean cold waters and put them to drain. Now have a vessel that will hold twelve pails of liquor and put in it four pails of fustic liquor, and four pails of logwood liquor, and put as much of Field's oil soap melted, in it, as will make it pretty strong of soap. This liquor must be a nice hand heat.

Now open out all your silks and put them in this liquor, then throw them up on a puncher and put them back again for an hour, fold them up, throw this liquor away



and make another of the same sort, open out your silks, put them in and handle them in this for another hour. This liquor must be as hot as you can bear it with your hands. Now fold them up and give them two warm soap liquors of three pails each, passing them through one at a time. When they are all passed through these two soap liquors make up a clean thin soap liquor of about four pails, then take up one silk, pass it through this, fold it up, smooth, wring it in a sheet, fold it, put it on a peg, and do the same with the rest, and when they are all done in this manner, hang them up in a hot room to dry, and when dry, they are ready to damp, brush, and frame, or roll.

REMARKS.—The aquafortis liquor in the stone pan must never be thrown away, it will last forever if helped a little every time it is going to be used. A loose lid must be put on it when not in use. The nitrate of iron liquor will also do again, but it requires helping with fresh iron liquor every time it is used. By this method of dyeing, the work may be prepared, rinsed, and laid on a peg all night and dyed in the morning.

*To make a Jet for Black Silks, to be used in framing and wetting out instead of Milk. To be used in clean Water, or in the Size when the Silk is Dressing.*

To make one pound of neat's-foot oil and one pound of soda, put both into a dry clean pipkin, and put the pipkin on the fire. Now stir them until they amalgamate well, and then they are fit for use. A teaspoonful of this jet is enough for a quart of size. A tablespoonful is enough for three pails of clean water. Put the silk in dry, keep it in about five minutes, no rinsing, hang it up to dry. In framing sago answers the purpose of jet size, or it may be used instead of milk; it is better.

*To make a Jet for Black Silks and Woollens.*

Take one quart of neat's-foot oil and one quart of the best neat oil of vitriol, put them both together in a

stone jar, and stir them well with a glass rod. Let them settle for a day or two, and when your black woollens or silks are too brown, jet them with a little of this jetting, rinse in a couple of waters, and hang up your silks in a warm room to dry.

*To make a French Puce Vat for Silks.*

Clean out a copper that will hold fifteen pails of water, and put half a hundredweight of the best logwood chips, and two pounds of soda into it. Fill it up with clean cold water, and get it on to a boil. Let it boil for an hour, and turn it over through a sieve into a spare copper; put the chips back again into the first copper, and fill it up with clean water, and boil well again for another hour, and strain as before through the sieve; put the chips back again into the copper, boil up again for the third time, and continue to boil another hour. Save your chips in a basket, for they will still do to dye black woollens with. Rinse out the copper, that no chips remain in it, and strain back the logwood you have been boiling into the copper, and reduce the three boils to one in order to concentrate it. Keep boiling, and filling it up with the logwood liquor out of the spare copper until it is reduced to the single copperful that you are boiling off in; when this is done, draw the copper. Put two sticks across the copper, with the copper lid on them and so leave it to cool; when quite cold then put the puce spirits to it. In page 20 you will see a description of a Puce Vat. See that it is clean and dry before using and to every two gallons of logwood liquor add one quart of puce spirits into the vat, loosely covered over with a lid, stirring occasionally for a week, when it will be fit for use. Some dyers put all the puce spirits at once into the vat, and turn over the logwood on the top of it; other dyers put two gallons of the logwood into a pail, and throw one quart of puce spirit on to it, then pour it into the puce vat pail after pail. I prefer the first method, it is the best way if done quickly.

*To make Puce Spirits for the Puce Vat.*

Get six pounds of grain tin and melt in a plumber's ladle, and pour it gently into clean water. Get thirty pounds of muriatic acid, and twenty pounds of nitric acid, and mix them in a large stone pitcher; drain the water from the tin, and add the tin gently. Put it in a warm place for a week, then put it away in a stone jar, with a stopper in it, in some dry place for a month, and it will be fit for use.

*Directions to Clean, Re-dye, and Finish 200 yards of Crimson Silk, Damask Bed and Window Curtains, and 200 yards of Tammy Lining of the above.*

When I had work of this kind, I sorted and took the damask into the dye-house and cleaned it first in four lots in four very hot soap liquors in the big puncheon tubs and gave them a hot thin soap liquor, wrung them out of it, and dried them out of this thin soap liquor in a hot room directly.

The crimson tammy lining I cleaned in the soap liquors that the silk damasks left, gave them a clean thin soap liquor to finish cleaning of them and gave these Tammys a strong common sour directly out of the soap liquor and one cold water after and dried them in a hot room directly. Now both lots are cleaned and dry.

I then boiled up two pails of peachwood twice in a twelve pail copper, this produced 20 pails of peach-liquor, had it cooled, and to 20 separate pails I put 20 separate quarts of crimson spirits, raked the vat and left it till morning. I then cleaned the copper of the old chips and boiled up two pails full of fresh peachwood chips in the twelve pail copper three times, strained through a sieve, turned these three boilings into one vessel and left this liquor to cool also for the night. This cleaning, drying, making the crimson vat, and boiling up the dye-stuff was done the same day.

The next day I cleaned out the big copper and turned



over twenty pails of the crimson vat into it and made four lots of my silk damasks, dry as it was, of 50 yards each, and gave each lot half an hour in the vat. As each lot was passed through the liquor, it was folded, and put on the horse to drain into a vessel and to feed while draining.

When drained I gave each lot three cold waters and put them to drain and gave each lot, separately, seven pails of clean cold water, and seven pails of the fresh boiled up peachwood liquor in it, and handled them well in this one hour, then folded them up and put them on the horse to drain. This liquor was thrown away, and a fresh one made up for the next, and so on for the four lots.

When they had had the four clean peachwood liquors, I returned them, without helping it with fresh spirits, into the crimson vat separately for half an hour, as I did at first, folded the lot up and put it to drain on the peg and got another lot in the vat and so on, until I had done the four lots. I then ordered my man to rinse them by giving each lot three clean cold waters, they were then wrung, and hung up in a warm room. The same evening I took them off the tenter-hooks, damped them, and in the morning brushed and sent them to Baverstock's of Great Russell street, to be finished; and when they came back they looked as well as new in color.

The tammy lining I dyed with cochineal and spirit first, and blued them to my crimson damask pattern with cudbear in the same copper; and, when done, cooled them out of the copper, gave them three cold waters when they were dry, picked, and shook them, and sent them to Baverstock's to be glazed, as tammy for silk damask lining is always glazed for a finish.

REMARKS.—I went through the whole process of cleaning, dyeing, and finishing these 200 yards of silk damask and tammy lining, which I have dyed this week, to show at one glance how cheaply, simply, and easily such a quantity of this, the best in our line of work, is done, if



the practice is reduced to a system. The crimson vat that this work has left is better than when I made it, I helped it with a little fresh spirit when I turned it over into the vat, covered it over and left it, in hope of soon having another job of the same sort.

It is usual to frame or roll silk damasks for a finish; but Baverstock's finishing machine excels in every way.

*To make a French Crimson Vat with Brazil.*

Clean out a copper that will hold fifteen pails of water, and put a quarter of a hundred of the best Brazil chips into it, and one pound of soda; fill it up with clean cold water, and get it to a boil. Clean out a spare copper to turn it over into; have a clean sieve over your spare copper ready when you want it. You must boil the Brazil chips and concentrate, and proceed in the same manner as with the logwood chips, and when cold put it on the spirits, and in the same quantities. In the making of the vats both should be alike, the only difference being in the colors; logwood and spirits making a puce color, and the Brazil and spirits making a crimson; there is a slight difference in the spirits, which I will describe.

*To make Crimson Spirits for the Crimson Vat.*

Get a large stone pitcher and put thirty pounds of nitric acid, and twenty pounds of muriatic acid in it, and well mix them. Add your tin slowly, put it by in a warm place while it is working, and when it is done put it in a stone bottle, with a stopper in it, and it will be fit for use in a month.

*To make a French Crimson Vat with Peachwood.*

This is a cheaper wood than the Brazil, it makes very good crimson, but not so good as Brazil; the boiling off

and every other part of the process is the same, so I will not trouble my readers with a repetition, as spirits and all are alike except the woods.

*Directions for making a Crimson Vat with Sapan Wood, or Brasileto.*

The process of making this vat is exactly the same as the above two vats. Some persons like it better than peachwood; in my opinion it is for brightness between the two, not near so good as the Brazil, but a little brighter than peachwood, without the body or strength of good peachwood.

*To Dye Silks Puce with the Puce Vat.*

Have a copper kettle, well scoured and rubbed dry with a cloth; bring it over to your vat, and nearly fill it with your copper bowl; put the kettle on your stand, under your kettle pegs, open out your work and handle in the liquor, never leaving it until you have the color you wish, which is obtained, generally, in about twenty or thirty minutes, sometimes less. When done, fold the silks up on your kettle peg, and give them three waters, put them on a peg to drain, and turn back the puce liquor in to the puce vat, stirring it well. Before you leave, well cover it over. Now tell your man to hang up your puces. This is the first working of the new puce vat you have had, and if it turn out well every week it is worked it will improve, so be careful of the liquor; every fifth or sixth time it is used it will want a little helping with spirits. Now we have done the French puces.

*To Dye Silks Crimson with the Crimson Vat.*

Put a clean copper kettle beside the crimson vat, and nearly fill it with your copper bowl out of the crimson vat; put it under the kettle peg, and open your work

and handle it in the liquor, and give it more time than you would the puce, but rinse and get up in the same manner, saving your liquor as before.

At this stage of proceedings I must let the secret out that *good* and *economical* crimsons are not sisters, they have no relationship.

This vat after all the trouble and expense, gets dragged out, as dyers call it, and we are obliged to vat our work first, then rinse, then give it a peach or Brazil pure-wood liquor and put back in the vat again; then rinse in two clean waters and hang up in a hot room to dry.

*To Dye Silks Crimson with Alum and Peachwood or Brazil.*

Put your kettle on a stand, and put in about two pounds of ground alum. Sort your work and handle it in this liquor for an hour; don't leave it during that time. Now get up your silks and give them one clean water; fold and put to drain on the peg. Have, boiled up and cool, by you, the first, second, and third boiling of seven pounds of peachwood, or two pounds of Brazil, for that is their proportionate strength. Now, all your boils being turned over in your cistern (see page 18), begin and dye your silks. Have a clean kettle, and put four pails of your boiled up dye-stuff into it, and handle your silks in it for twenty minutes; get your work upon your peg, and throw this liquor away, and give another liquor of the same sort; and also at the same time fold up your work again, and throw this liquor away, and put three pails of warm water in your kettles. Put your work in the liquor for ten minutes, fold up on the peg smooth, wring in a clean sheet, and hang up to dry in a warm room. When dry, damp, brush, and frame, and the work is done. This was the method of dyeing crimson with peach and Brazil before the vats were thought of.

*To Dye Silks Ruby in the Alum way.*

You must dye them crimson first, with peachwood, as above, and in your third liquor put in a pint of red or

blue orchil. Handle your silks in this liquor in the kettle, and lift the kettle so as to swim in a boiling copper; keep handling your silks in the kettle until it is a great deal too hot for your hands; now lift them out of the copper, fold out of this liquor; they must be got out of this liquor and dried, and by no means rinsed; take your wringing sheet and pass it through this liquor, and wring up your silks in this sheet; smooth them out after this, and wring up. Hang them up in a warm room to dry, and when dried, damp, brush, and frame them, and they are done.

REMARKS ON DYEING THE ALUM WAY ON SILKS.—In my instructions to dye alum crimsons, I gave the way of dyeing with hot alum, as a preparation; now this is not the usual way of preparing alum work of any sort; the common and the best way of preparing silks to suck up any dye-stuff, is by giving them cold alum, and a good time in it; the silk by this mode of using, gets time to imbibe the crystals, which crystals carry the dye-stuff; alum cements, as it were, the dye-stuff to the silk, or, more properly speaking, floss of the silk. In dyeing alum work on silk, if the two first liquors used be too hot, it is sure to melt the crystals of the alum, and you have a poor color. When you have your dye-stuff on your silks, you must then finish with a hot liquor with some peach or Brazil liquor in it; hot water only will injure your color. Hot clean dye-stuff liquor takes the alum out, brightens the wood, and makes the silk wet freely in the frame.

*To Dye Tabaret Crimson without a Crimson Vat, Alum, or Sumach.*

Begin and clean it in one of your tubs with the best melted mottled soap, with a little soda in it, as hot as you can bear your hands in it, hotter if you like. I want all the color taken off; if it is crimson off it must come. Also when cleaned, spirit it in a tub of cold water, directly out of the soap liquor, while the soap is



fat in your work; give them one cold water out of this and put them on the peg to drain. Cleanse out one of your spare cold coppers, and fill it with scalding hot water, and put one quart of neat crimson spirits in it for every twenty yards of tabaret; handle it in this very quietly for two hours; get it up to drain, and give it one tub full of clean cold water, and hang it up in a warm stove room to dry quickly. You may dye this when dry in Brazil or peachwood, boiled in the usual way, but you must put this work into the boiled-up dye-stuff, very hot, that is the extract from the three boilings you give your chips. It is to be put into an empty copper, well cleaned before you put it in, through a sieve. Take your tabaret, dry as it is, and in one armful, and after opening it, put it into your boiled-up dye-stuff, and push it down with a stick; now handle it well for an hour, take it up on your clean puncher on your copper three times during that hour, and put it back again. When the hour is up, throw it on your puncher, and give it one quart of crimson spirits, for every twenty yards of tabaret; handle it in this liquor for one hour more, and it is dyed; fold up on your puncher, and put it on a peg to drain. The next is three clean cold waters separately, fold up out of the last water, wring, and hang up to dry in a very hot room. When dry, damp, brush, and water them, and they are done.

REMARKS.—It is absolutely necessary to dry, and quickly too in a hot room, this work out of the first crimson spirits, it is the mordant, as they suck up all the dye-stuff when put dry in the copper, and as a matter of course they are a fine color; you may depend on the reverse if you do not dry them.

#### THE COCHINEAL.

“Cochineal is the body of the female insect which is produced, grows, is fecundated, attaches itself to, and dies upon the leaf of a napal called cactus, from which it draws the juice. Its body dries on it, and is collected

by the natives of South America, who particularly cultivate and take care of this insect. The wild cochineal, which is enveloped in an external spinning, is distinguished from that which is cultivated, and which loses this covering, at the same time acquiring a greater bulk and a richer color. This production has long been considered as a seed. It is in Mexico that the cochineal is cultivated, and also spontaneously produced. Its form, its structure, the number of its rings—all its characters, in short—develop themselves when it is steeped some time in water. Its coloring part has been particularly an object of attention, as it is from this that its great use in the art of dyeing arises. The muriate of tin gives a deposit of a beautiful red, which is more abundant when tartar is added to the decoction. Cochineal is the most valuable of the red coloring matters which are employed in dyeing. The red crimson, poppy, orange, violet, and scarlet dyes are done by it. Carmine is prepared from cochineal. It is a kind of lac precipitated from its decoction, mixed with alum by the alkalies. Autour and kouan are mixed with it, in order by their yellow to render the too deep red of the cochineal lighter, and obtain the brilliant color of the carmine.”—From “Fourcroy’s Chemistry,” Volume x. page 497.

“A little while after the cochineal became known in Europe, the scarlet process by means of the solution of tin was discovered. It is stated that about 1630 Cornelius Dribbell observed, by an accidental mixture, the brilliancy which the solution gave the infusion of cochineal. He communicated his observation to his son-in-law, Kuffelar, who was a dyer at Leyden. He soon improved the process, kept it secret in his workshop, and brought into vogue the color that bore his name. The discovery of the scarlet dye may be regarded as the most remarkable era in the art of dyeing, not only by the lustre but also the brilliancy we can impart by means of the same process to other colors. The color which cochineal gives naturally is a pretty crimson.”—From Dr. Ure’s “Elements of the Art of Dyeing,” Volume i. page 24.

*To Dye Silk Crimson with Cochineal or Grain Crimson.*

Fill your alum tub with clean cold water, and for every fifteen yards of silk, melt in it eight ounces of alum; when that is done, open out your silks and handle them in your alum tub for five minutes, then take them up on a peg and put them back again and leave them for twelve or fourteen hours, much longer if you like, but they must be taken up and returned every six hours. Clean out a copper and fill it up with clean water, and for every fifteen yards of silk, put in four ounces of cochineal. Make it boil before you put in the cochineal. Continue to boil well for ten minutes, and leave, and get your silks up out of the alum and give them one clean water; fold them up and put them on a peg to drain. Now stop the cochineal copper from boiling, by gently damping the fire so as to keep your copper to a scald; open out your silks and handle them in the cochineal copper with a clean stick, for half or three-quarters of an hour at the utmost; then get them up and rinse them in two clean waters, wring them up with a clean sheet, and hang them up in a dry room. When dry, damp, brush, and frame them, and they are done.

Some dyers put a little ground galls boiled in the copper, and a little tartaric acid before they put in the cochineal to boil.

*Another way to Dye Grain Crimson.*

Alum cold as above, rinse in two clean waters, then put two ounces of crimson grain spirits in the copper with the cochineal. After you see that it boils, damp down the fire, and put it in, stirring it well. Now open out your silks in the copper, and give them exactly the same process as the above.

REMARKS.—These crimsons are the finest colors, and cochineal is now so cheap, that I am sure they will be more generally adopted.



*To Dye Silk Scarlet in Grain.*

First give them a very strong body of annotto, and put them for a night in cold alum; rinse, and give them a cochineal copper scalding hot, with two ounces of scarlet silk grain spirits to every China crape shawl, and every fourteen yards of silk you may have to dye scarlet in this week's working of scarlet silks. In rinsing the scarlets you must give them three clean waters, and a little oil of vitriol in each separate water; they must be got up with great care, the room must be very hot. Dry and finish with parchment size.

*To Dye Orange with Cochineal.*

Oranges must follow the scarlets in the annotto and cochineal coppers, as what is left is quite strong enough for the orange colors. They are cleaned, dyed, dried, and dressed in every way alike; but the scarlet having the strongest dye-stuff, requires to be done first.

*To Dye Silk Puce with Alum.*

Open out your silk and handle well in cold alum, let it lie there for a night if you cannot find time to dye it at once. So much the better, it will be a firmer and richer color; but you must take your silks up and put them back in the alum twice in that time. When you are dyeing them, you must proceed in every way like the alum crimsons, only this difference, that in your peach liquors, you must put in one pint of logwood liquor to every gallon of peachwood; they are rinsed, dried, damped, brushed, and finished alike.

*Violets from Brazil Wood and Logwood.*

Silk for these violets must be alumed, cooled, and rinsed as usual. It is dipped in a liquor of Brazil wood, of the common heat; when it has imbibed this liquor a



decoction of logwood is added, and the color being properly full, is then changed by adding some lixivium of pearlash. It is afterwards washed, wrung, and dried as usual.—From Monsieur Macqueer's "Art of Dyeing Silk."

### *Half Violet.*

For one pound of silk, take a pound and a half of orchil, mix it well in the liquor, make it boil for a quarter of an hour; dip the silk quickly, let it cool, wash at the river, and you will have a fine half violet lilac, more or less full.—From Monsieur Macqueer's "Art of Dyeing Silk."

### *To Dye Silks Marone with Alum and Peachwood.*

Handle your silks well in the alum cistern; give them as long as you can in it, handling them every six hours. When you are ready to dye them, fold up and give them two clean waters, and put them on a peg to drain. Now dye them, by putting four pails of cold peachwood neat, into a clean copper kettle, and handling your work in it. Now lift the kettle to swim in a boiling water copper, handle you work well in this liquor all the time it is floating. When it gets too hot for your hands, get it out on your stand, and fold it up on the peg, and put in half a pound of cudbear. Stir this well in your kettle, and put your work back again, and lift your kettle into the boiling copper to swim a second time. Keep handling in this until it gets too hot for your hands, and now you must use a clean stick, keep turning over the stick for ten minutes, and get the silks out of the copper on the stand, fold them up on the peg, throw away the liquor you dyed them with, and give them three warm waters in the kettles; fold them up on the peg, get a clean sheet, wring, fold, and hang them up in a warm room. Damp, brush, and frame them, and they are done.

REMARKS.—You will please to observe that these ma-

rone silks have been dyed in one liquor instead of three, as is the usual way in the trade; and that after rinsing them, I began with neat cold peachwood liquor, and got it on by degrees. By putting the kettle to swim in the boiling copper, this will be a splendid color when it is dry. In the framing it will wet like a sponge.

*Silks Dyed Claret with Alum and Peachwood.*

Open out your silks and handle them well in the alum cistern, give them not less time than six hours, longer if you can. When your time is up, fold them up out of the alum, put them under a peg to drain, and next give them three separate waters.

Observe, that no alum work is to be allowed to remain in the water any longer than while you are rinsing it.

Now fold up your silks, and put them on a peg to drain, and begin to dye them. For shortness, I must refer you to the marones, and when you are going to put in the cudbear, you must also put in half a pound of turmeric and a quart of logwood liquor; after these drugs are put in, put your work in the kettle, lift the kettle into the boiling copper; and now I will leave you to dye. Rinse, and afterwards hang up to dry, the same way the marones were done.

*Terra Japonica, Catechu or Cutch.*

This is a substance containing much tannin, and is a dry extract prepared from the wood of a species of sensitive plant named *Acacia Catechu*; it was long considered an earthy substance, and termed *Terra Japonica*; it is an East Indian plant and grows abundantly in mountainous districts; it grows to about twelve feet in height, the trunk about a foot in diameter, and covered with a thick, dark brown bark. The extract which is obtained from the tree is made from a decoction of the wood. As soon as the tree is felled all the exterior white wood is cut off, the interior or colored wood is

cut into chips. Narrow mouthed earthen pots are filled with the chips and water-heat is applied, and when half the water is evaporated the decoction, without straining, is poured into earthen vessels and is reduced two-thirds by boiling; it is then set in a cool place for a day, and is afterwards evaporated by the heat of the sun and kept stirred all the time, and when very thick it is spread on a mat covered with the ashes of cow dung and is dried in the sun, and is then fit for sale. It is a brilliant compact substance, of a dark brown or chocolate color, has no smell, is soluble in cold or hot water, of a reddish color, and has a great amount of tannin and a peculiar acid in it named Catechuic acid.

Acids brighten the color of the solution, alkalies darken it, it gives fawns, drabs, olives, and browns with it, and any sort of iron liquor, nitrate and sulphate of copper a brown, bichromate of potash a deep red brown, and is an agent in the hands of the dyer for stuffing all sorts of silks for dark colors by adding nearly double weight to the natural silk. It throws sumach and galls into the shade for this *honest purpose*, and rots the silk.

There are various qualities of catechu in the market differing considerably in their value as a dye, Bombay, Bengal, and Malabar is the best. From "Napier's Manual of Dyeing," p. 263.

*Silks Dyed Hair-Brown and Rappee with Alum and Peachwood.*

Put your silks in alum, and dye them exactly like the claret, and when you come to rinsing them up for a finish out of the dye-stuff, stop there, and instead of rinsing them, give them a good hot copperas and water in a kettle to both colors. Let them be a quarter of an hour in this, well handling them all the time; get them up and rinse them in two cold waters, and put them back in your dye-stuff kettle, and lift the kettle into the boiling copper to swim; when too hot for your hands, get it out on your stand, and fold them up on the peg,



taking the hair browns and giving them to your man to rinse and hang up as they are done. Your rappees are not done yet; you must return them into the copperas kettle, making it a little stronger with more copperas. Handle your silks well in this for a quarter of an hour; get them up and rinse, and return them into the liquor, put it to swim in the scalding copper, and when too hot, get it out on a stand; fold, rinse, and hang them up, and they are done; when damped, brushed and framed.

*To Dye Silks Claret with Cochineal.*

Put your silks and China crapes into your alum liquor, see that it tastes pretty sharp of the alum; handle your silks well in, and get them up on your peg, and put them back directly. You must not give this work less than six hours in the alum, you may give it two days if you like, but you must fold it up and put it back again every six or eight hours. When it suits you to dye it, fold up and put on a peg to drain. For every dozen yards of silk you have to dye claret, give eight ounces of cochineal, and boil it up in the copper you intend to dye them in for ten minutes; now open the copper door and gently damp the fire, put your work in the cochineal liquor, and handle it for ten minutes; then get up and for every dozen yards of silk put in the cochineal liquor, add four ounces of turmeric and half an ounce of Aleppo galls in powder; the silks to be put back again into the liquor with these additions to it, and handled well for twenty minutes. While you are handling your work in the copper, tell your man to make up a hot saddening in a clean kettle. Get your work up and sadden it for about twenty minutes in the liquor. Get it upon the peg, and rinse it in two clean cold waters, and return it to the copper again. Keep up your copper to a scald all this time; now give it twenty minutes in this copper, and get it up, rinse, and it is done so far. Dry it in a good hot room, and when dry, damp, brush, and frame them with clean parchment size.



REMARKS.—This is a superior claret on silk—so simple that any person can do it; it is cheaper than Brazil, for you have only to put what cochineal you may want into the copper, and it is ready for use, whereas you have to boil up the Brazil before you use it. It depends on the pattern whether your work will require a second saddening and a second return in the dye-stuff copper; it will be a stronger color if done so.

*To Dye Silks Yellow with Alum and Weld.*

To dye silks a bright yellow you must give them a fresh alum liquor. Handle them well in for five minutes, take them up and put them back and leave them for a night. Clean out your copper, and for every dozen yards of silk give three pounds of weld, and one ounce of soda; boil the weld for one hour, and strain through a sieve, and it is ready for use. Fold up your silks out of the alum and rinse them in two clean cold waters; fold them up and dye them. Open out your silks and handle them in the weld for an hour, and they are dyed a very nice bright yellow. Give them two clean blood-warm waters, wring, and hang them up in a warm room to dry; when dry, damp, brush, and frame them, and finish with care.

REMARK.—If your silks are for full yellow, you must add a little turmeric to your weld, it improves them very much. Some dyers prefer getting the work that is dyed with weld out of a soap liquor instead of warm water; the silk has more lustre out of the soap.

*To Dye Silks Gold Color with Annatto, Alum, and Weld.*

This color must have a very slight body of annatto first; then alumed, rinsed, and dyed in a weld liquor, the same way as the silks for yellow; then rinsed, wrung, hung up in a warm room to dry, and finished.

*To Dye Silks and Furniture Amber with Alum, Weld,  
and Annatto.*

Silks to be dyed amber must have a buff ground, dyed with annatto, then alumed, and dyed with weld and turmeric. The turmeric is to be much stronger than for gold color. When done, to be rinsed and finished as above.

REMARKS.—Dyers very seldom use weld, for it is a very slow process; the usual way for silks, satins, damask curtains, tabaret and other silks for amber, is to clean them and give them annatto in a soap copper boiling hot, and give them turmeric in a separate copper also, with spirits in it, and a couple of waters after. Dry them in a hot room, damp, brush, and frame the silks, and send the tabarets to the waterer's. The damask curtains are to be framed. Baverstock's finishing for these damasks is much superior to rolling or framing.

*To Dye Brown Amber with Cudbear, Annatto, and  
Turmeric.*

Clean out a small copper and make it boil. Put half a pound of soda in it, a bowlful of melted soap, a quarter of a pound of cudbear, and a quart of annatto liquor. Boil all these drugs for ten minutes; open your copper door, and put half a pail of cold water in. Have a couple of clean sticks on it for your use, and open out your silks and handle them in the liquor for twenty minutes. Have a thin soap liquor by you, and when the time is up, take your silks out of the copper, and put them in it, and well handle, and fold them up on the puncher-head. Have a clean cold water and spirits to handle them in out of the thin liquor; fold up out of this and put them on the peg. Now proceed to dye them. Clean out a copper kettle and put one pound of turmeric in it, and six pails of scalding water, well stirring the turmeric as you put the water in; now cover it over for ten minutes. While you open out your work

uncover it, and handle it in the turmeric kettle for five minutes, now fold it up on the peg and put in your liquor a tablespoonful of oil of vitriol; stir this well and put the work back again in the liquor for ten minutes, well handling it all the time. When it is dyed, fold it up and give it two clean waters, with a little sour in each water, fold it up, wring it in a clean sheet, and hang it up in a warm room to dry. Damp, brush, and frame it, and it is done. The time this lot of work has taken me to dye it and hang it up to dry, is two hours.

*To Dye Silk Straw Color and Primrose with Ebony.*

Scald half a bowlful of ebony in a pail of water, in a clean kettle, strain off the ebony, work it in a clean kettle with a little sour. Some dyers use a little soap instead of sour. Rinse in a clean water, and hang up to dry. The straw color has a slight touch of annotto in it before you give it the ebony. Some dye in the strong ebony liquor that the primroses leave; not in the primrose liquor, that is thrown away, but in the scalded liquor strained.

*To Dye Silk in the Puce Vat Violet.*

Turn over a thin puce vat into a kettle; open out your silks and handle them in it until they are a poor puce color. Get them up, and rinse them in two warm waters, and put them to drain while you turn over the puce vat in the cistern (see page 20 and page 92), and put four pails of warm water in the kettle, and scald up half a pint of Saxon blue in a quart stone mug. (See Saxon blue in page 60.) Put a little common sour in your kettle with a half a pint of this Saxon blue, and handle your silks until you bring them to your pattern; if they are not blue enough take them up and give them more Saxon blue in the same liquor, and get them up on your peg to drain. Now turn this blue liquor into the green liquor cistern (see page 19 and 70), and give



your silks two clean waters with a little common sour in each water, fold them up, wring, and hang them up to dry. When dry, finish them in the usual way, and they are done.

REMARKS.—This is one of the colors that I always sheet up dry in my shawl sheets, and brush them ready for the frame, without putting them up to dry. I consider there is no occasion, as I sheet them up dry. The shawl sheets I have been using, I return to my man to give a couple of hot waters and hang up in the warm room, to be ready to sheet up the silks and the shawls when wanted.

*Meaning of Common Sour, as a Binder of Colors.*

As I have so frequently to mention common sour, it is proper that such of my readers as are not dyers and scourers, should understand what it means—it is simply vitriol put in clean waters to harden or fasten the colors. Where there is blue, green, scarlet, or crimson, we put it in the water, slowly stirring it all the time until it tastes sharp; we then give our work a cold water after it. Common sour is of great importance in cleaning and dyeing, although it has a *common* name; and dyers cannot do without it. In giving the work a cold water after the common sour, it must be done quickly, as if it is kept long in the water it will take the sour out of the work entirely, and we do not want that.

*To make a Peach and Lavender Vat from the Puce Vat.*

Have an earthenware vessel that will hold four pails of water; let it be about eighteen inches high, and twelve inches wide, fill it with clean water within a pailful of the top; first put in common sour, until you make it taste; then put three quarts of puce spirits into your clean copper bowl, and put it into the vessel very quickly, do not delay a moment, stirring it well with a clean stick. Put in half a pint of your puce vat (see page 92),



and stir it well with a clean stick. It is now fit for use, and called the lavender vat, and we will begin and dye peach color with it first. Open out your silks and handle them in the vat for about ten minutes, fold up and rinse them in two clean waters, and they are done. When dry, damp, brush, and frame them. The French blues that are to have a lavender, are to be done after the peaches, but there must be no Saxon blue in a lavender vat you intend to put the French blue through, nor any other blue. They must have a clean peach body of color only on them. All old work for French blue ought to have this vatted peach color on them and dyed directly for French blue.

*To Dye Silk Lavender in a Lavendar Vat.*

There are various shades of lavender: I will begin with red lavender first. Put about a teaspoonful of the scalded Saxon blue in the liquor, and stir it well; now open out the work and handle it in the vat for twenty minutes. Get it up, rinse it in two cold waters, and make the two waters taste a little with common sour. Wring it and hang it up, and it is done, at least as far as the dyeing goes; it has to be damped, brushed, and framed, and is then completed.

*To Dye Silk Gray in a Lavender Vat.*

This vat, helped with a little more Saxon blue, will dye another lot of silks lavender. Before it will dye the gray, the red must be nearly worked out of it, and then we will begin the gray silks. It is very simple. To the vat as it is, put a little Saxon blue, and have a clean white saucer, and look at your pattern. Take a little of your vat up in your saucer, and see if the liquor is the color of your pattern; if not, add very little more puce vat and blue to it. You must always at first keep your dye liquor under your pattern. It is very easy to add to your liquor more dye. In fact, a good dyer is like a

good jockey; he nurses his horse in the race, and only wants to win by a length; more he does not want. And a good dyer will dye his silks to his pattern, and no more. Now open your silks, and handle them for twenty minutes or half an hour in this liquor, and if they are to your pattern, get them up; if not, give them more color and more time, and fold them up on your kettle peg to drain. Clean out a copper kettle, and give them two rinsing waters, and make them taste with a little common sour; fold on a clean puncher-head, wring them up in a clean sheet, and hang them up in a warm room to dry, and, when dry, they are ready for dressing.

REMARKS.—These are some of the colors that I always sheet up dry in the shawl sheets. I never hang them up, but brush them directly after I sheet them, and fold them up in a clean cloth, and put them in the drawer for framing. I lose no time by sheeting them up, for they would take some time to hang up and take down, besides damping, and the danger of an accident with such a light color. In the skein dye-houses and drying rooms, there is no fear of accidents. The work is not of such a mixed description as with dyers and scourers.

*To Dye Silk Drabs in the Lavender Vat different ways.*

The lavenders and grays are done in this liquor first. But we shall dye many other colors with it before we leave off. We will now proceed with the drabs. Boil up two pounds of fustic, or ebony, in two gallons of water; it must boil well for an hour with a pinch of soda in it, strain this off through a fine sieve, and place it handy by you. Let your light drabs be the next. Do not put anything in your liquor after your grays, except a pint of this ebony liquor; stir it up well, and handle in your silks for light drab for twenty minutes, and they are done; rinse them in two cold waters, with a little sour in each water, and hang them up in a hot room to dry.

The next drab you dye in the vat is a dark stone drab.

In page 74 you will see I have dyed drabs another way, with sumach and saddening. Put in your vat now half a pint of puce vat, one quart of ebony liquor, and a tablespoonful of the scalded Saxon blue; open out your silks, and handle them well in the liquor for half an hour, and they are dyed a dark stone drab. These must be rinsed and got up like the other drabs.

The next drab you will dye in this liquor, is the drab you have no pattern for; now where we are not confined to a pattern, and the color is left to ourselves, as in this case, we can do the customer more justice, for when we are confined to a positive pattern, it puts our wits to work. Now this drab is the drab of all others I like; there is no adding or diminishing the liquor in the vat, for it is a Godsend to me, that have been working at lavender gray and drab patterns all day, not to have a pattern to the last. Open out your silk, and handle it for half an hour in the vat; fold it up on your kettle peg to drain; give it two clean cold rinsing waters, with the sour to taste in each water; wring it up and sheet it in your shawl sheets. Do not leave it until you brush it, and place it in a clean cloth in the drawer for framing.

### *To make Fawn Color Drabs.*

Boil one ounce of fustic, half an ounce of alder bark, and two drachms of orchil, or as it may occur. I frequently make use of old madder liquor that has been used for dyeing reds, when nothing but the brown dregs of the madder remain, the red having been all extracted. But if the madder is boiled an hour or two strongly it has the same effect. From one to four drachms of the best crop madder must be added to a very small quantity of old black liquor, if at hand. Supposing you require your silks to be darker, if you have no black liquor, a small piece of copperas will answer the same purpose.—From “Tucker’s Family Dyer and Scourer.”



*To Dye Silk Fawn Color and Esterhazy Drab in the  
Lavender Vat.*

Put to the same liquor you have been using one pint of puce spirits, half a pint of puce vat, and the remainder of your ebony liquor. Dye your silks for dark fawn first; get them up and rinse them, and hang them up to dry in a warm room. The next color you dye is the light fawns. Open them out, and handle them in this vat for twenty minutes, and they have done. Rinse in two waters, wring and hang up, and finish them.

The next color in this vat before you have done with it is Esterhazy drab. Put one pint of puce vat to this liquor, and clean out a kettle well. Turn this liquor into it, and open out your silks, and handle them; now lift your kettle in to a boiling copper to swim, handle the silks in it all this time, and when it gets too hot for your hands, take it out of the copper and put it on a stand, fold up and rinse in two clean cold waters with a little sour in them, wring up in a clean sheet, and hang them up in a warm room to dry. When they are dry, damp, brush, and finish all these colors with parchment size.

REMARKS.—The lavender vat is a very useful one in the dye-house, as you may see from the number of colors I have dyed in one vat. I have done nine very opposite colors, and to count six different shades for every one of these nine colors, it would make fifty-four pieces of silk, of fifteen yards each piece, in a vessel holding between five and six pails of lavender vat, and the other dyes put in it to produce the different colors. Even after this vat has turned out of it so many different colors, it is not thrown away. Add about a quart of puce spirits, and put it where the puce and crimson vats are, and when the drab silks are to be dyed again, it is as good, if not better, than it was at first, with fresh blue ebony and puce vat. The puce, crimson, and lavender vats, must be put by themselves, covered over in some dry place out of the way.



*To Dye Silk Ruby, Violet, and Lilac, with Orchil.*

There are two kinds of orchil, one called rock or land orchil, a kind of moss, the production of the rocky mountains of Spain and Portugal; the other the sea orchil, comes from the Canary Island and the West Indies, and is gathered near the sea-side, and is sent to London as it is gathered. The materials used to develop its coloring properties are urine, potash, saltpetre, and lime; it is steeped in very large wooden vats. The orchil manufacturers live near Spitalfields, that part of London where skein silk dyeing and weaving silk is principally carried on. It is sold weed and liquor together, and sent to the drysalterers and dyers in little firkins of a quarter of a hundredweight each. It is a splendid but a fugitive dye-stuff. It is a self-color requiring no preparation; you have only to put it in the copper, give it a boil, damp your fire, open out your silks, and handle them in it. It will not by any art yet found strike on cotton or linen. It is also made into a paste, and the summer muslins are dyed lilac with it, a little flat blue, and pretty peach violet; and lilac flowers are stamped on summer muslins with it and gum, but they wash out the instant they are wetted. It is different with silk goods, they will clean with care; it will dye woollens as well as silk, but it is seldom used, as it is too dear; they suck up too much.

Should any of my fair readers have a fancy, as many have, to dabble in dyeing, I must inform them there is red and blue orchil, as it is sold at this end of London at Barnes', drysalterers, in Long acre. A pound of it will dye many little articles in silk, used either with or without soap, and a little lemon juice should be used in the rinsing water if a pinkish shade is wanted.

*To Dye Silk Ruby, Peach, Violet, and Lilac with Orchil.*

Clean thoroughly the little copper, and fill it with clean water, and put half a bowl of orchil in it; do not

take the liquor only, but take the weed with it. Let your copper fire be damped and put your work in. Handle it easily in your copper for half an hour, and have a little kettle clean at hand to cool your silks in. Take the silks up out of the copper, put them in your little kettle, handle them over for a minute or two, and fold them up on a puncher-head; then give them to your man, and tell him to give the rubies three clean separate cold waters, and hang them up to dry in a warm room, and you begin the violets in the ruby copper.

Damp down your copper fire and turn over every drop of your ruby copper weed and liquor into one of your spare kettles, merely rinse your copper with a pail of clean water; dry out the copper, and do not let a particle of the weed remain in it. Now, put your sieve over your empty copper, and turn through the sieve the orchil liquor you just turned into the kettle. The weed may be thrown away, as it is of no further use. Put a handful of soda in your copper, and a little melted soap, so as to make a thin soap liquor of it (it must be a *thin* soap liquor, you must mind that). Open out your silks for violet, and handle them with a clean stick in your copper for a half an hour; have a nice clean warm soap liquor with a little Saxon blue in it; handle the silks in this for ten minutes, fold, wring, and hang up in a warm room to dry.

The reader will understand I am working blue orchil now; in page 98 he will see I worked red orchil.

The lilacs go into the copper next, after the violets. Put in your copper a little more melted soap, no more color is required, and dye them the usual way, and dry them.

Make your copper much stronger with soap, and dye the French whites. You must have a clean thin soap liquor for those out of the copper, and give them two warm waters after, wring, and hang up to dry, and, when dry, take them down, and damp, brush, and frame them. The reader will see that I began my instructions for dyeing silks with dyeing blue, and I now finish with

dyeing French white, and will please always to bear in mind that work too closely hung up in a hot drying-room has the color materially affected by the vapor or steam drawn off the goods, and that all work should be hung up directly it is cleaned or dyed, and, when taken down, folded before they are left, as work taken down out of a hot room and not folded gets creased, which never comes out—particularly woollens.

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## CHAPTER II.

### THE ART OF DYEING AND SCOURING.

#### *Wool in its Natural State.*

THE wool of the sheep is most likely the first article that was ever dyed by man. A taste for brilliant and glowing colors has prevailed in all countries and in every age; and though dyeing, like most other arts, seems indebted for its origin to accident, it can be traced to very high antiquity. We learn from Genesis that Jacob presented his favorite son, Joseph, with “a coat of many colors;” and as the Jews soon after their departure from Egypt, understood the art of dyeing purple and scarlet—an art they most probably learned there—it is pretty certain that at least 1500 years before Christ, dyeing was practised by the Egyptians. These latter people probably derived it from one or other of the nations of India with whom they traded. The ancient Britons, Welch, and Irish used to dye the sheepskin with the wool on it, by the means of chamberlye and a plant called woad.

Wool, like any other hair, is a kind of tube, filled up with oily matter. When this is expelled by cleaning, its place is taken by the dye-stuffs. Of all substances, on account of its porous nature, wool is the easiest material to be dyed, and will suck up any quantity of color



given to it; for when the oily matter is expelled, we can plainly see it is ready to receive any light particles of color that by degrees may insinuate themselves, by force or otherwise, into the empty tubes. That is evident, from the simple cause of attraction. I say this not from reading or theory, but from every-day experience for a number of years.

There are many ways of cleaning wool as it comes from the sheep, but the easiest and best way is to clean it in soap and soda, or ash; for the ash that turns the natural oil that is in it into soap. You can see that the tubes are filled with an oily matter, that only requires an alkali to turn it immediately into soap. There is no alkali that will injure wool if used with care and judgment. Certainly, if Dyers and Scourers will use scalding-hot soap and ash liquors to woollens, they will rot the fabrics. Dyers know this, yet I have seen it done in my time, and that by men who ought to know better.

Wool as it is sheared from the sheep is called fleece. Before it can be dyed any color, it must be cleaned of its natural fat. Good wool, for light colors, must be cleaned in soap. Inferior wool is cleaned in chamberlye, hand heat, and afterwards well rinsed and put to drain before it is dyed. It loses in cleaning twelve pounds to every hundred-weight, more or less. Some kinds of wool do not lose so much as others. Boiling water will have no effect in taking the grease out. It binds it more than it serves the wool. Soap, pearlash, and soda only will remove the oil from the wool. The goodness of the color entirely depends on the cleaning it gets before it is dyed. To clean the wool for dyeing as it comes from the sheep mottled soap is the best. Considering the state of the arts among the ancients, and comparing them with what they are at present, we frequently find that they were ignorant of nothing of what we either know or do—this is true with regard to dyeing, as the practice of our work in producing colors on silk, cotton, and woollen fabrics is the same and answered the same purpose centuries ago as it does now: viz., for clothing and furniture;



but how they dyed these colors we are entirely at a loss, for there are books on all subjects before the birth of Christ handed down to us from generation to generation. But there has never been one book on dyeing written by an English, French, or an Egyptian practical dyer to this day—it has always been chemists, and they know nothing of practical dyeing—a chemist's shop and a dye-house are different places. No practical dyer ever wrote his practice but myself. I have made a beginning, and I hope something better will follow.

Our scouring of wool, ungumming of silk, and cleaning of cotton for dyeing is nothing more than the same operation, perhaps differently performed for these different substances, but intended for the same purpose, that is to divest them of the unctuous and extraneous matter which prevents the colors from adhering and tarnishes their brightness. The color white being the reflection of all the rays of light, it follows that bodies are incapable of being whitened till divested of his inherent substance, which obstructing their pores, prevents the reflection of the light. Alkaline salts act most powerfully on this substance because it is of an oily nature. Alkalies are generally used either in a pure or a soapy state. Acids are used for the same purpose on cottons in whitening them, and to divest them of a substance that will not yield to alkalies. Wool is commonly cleaned with fermented urine, which forming a soap with the unctuous matter, easily carries it off. In order to divest silk of its natural yellow it should be boiled in soap and water. Fixed alkalies would do as well, but these are not used because they naturally corrode all animal substances. It was formerly the custom of the ancients to clean their wool with a struthian plant, which might be used in the ungumming of silk. It is called struthian by the Greeks. The root of this plant has the virtue of giving to wool softness and an astonishing whiteness; it grows on cultivated ground, and it is naturally the same plant that is called soapwort in this country, and is used to this day by the country people.

Some persons call it the fulling herb for woollen fabrics. This soapwort grows near rivers and ponds, and has a long reddish fibrous root, broad leaves, like a plantain. There are several plants that can be used for the same purpose; first, pellitory, growing in old walls and ruins; second, macule, the stalk and leaves, when pounded, make a sediment which is used for soap. There is also a seaweed called leferon, on the sea shores, the leaf is fat and has a salt taste; its flower white and bell-shaped—a species of soldanilla—this was also used as soap. There are other plants the ancients used as soap, viz., the peplos, or round spurge or poppy, the small field spurge, and the large field spurge, and marsh tithymal, otherwise called black or bastard turpeth, which grows on the banks of hedges, rivers, and ponds. All these plants have an abundance of milky caustic juice in them, which always has plenty of scouring and alkaline properties in them.

There is a plant used by the natives of California as a substitute for soap, called paphron, which answers very well for every purpose in scouring. The ancients, as well as ourselves, always burnt seaweed and trees to make powerful alkalies. Turpentine was always used for cleansing purposes, and lately it was discovered, when distilled, it would clean, by immersion in it, the most delicate fabrics and colors, and this distilled turpentine is now called camphene. To this day, in the country, they make a lye for washing—the liquor is sour butter-milk put in a large tub, and bran, oatmeal, and rye flour put in it, and kept in until it becomes sour, and the juice of sorrel is used in the last rinsing waters to whiten the articles. To bind and improve the colors, it is stiffened with potato-starch for a finish;—so, in fact, dyeing and scouring is not a modern invention, it always was in use and always will be. Such minute inquiries may perhaps be thought instructive. Some will say that these plants were used at a time when soap was but little known; but, as soap is so easily and cheaply procured, there is no necessity for using them now.

There is a quantity of ammonia in rain water which makes it soft and fit for washing. Some people think it is the lime in the roofs of houses that makes rain water soft—it is no such thing.

*Re-cleaning Manufactured White Woollen Cloths, for White, Blue, White, Scarlet, and other Colors.*

Fleece, or wool, intended for white, pale blue, gray, rose, amber, crimson, scarlet, and other single colors is manufactured before it is dyed; because, from the processes it has to go through before it is made into warp and weft for the weaver's loom, you could not prevent hairs of another color from mixing with it. How would a white look with numerous hairs of scarlet wool scattered all through it? and how would a scarlet look with a number of white hairs in it? The woollen-draper perhaps tells you the cloth he is selling you is dyed in the grain, and you take his meaning to be that it is dyed in the fleece. No such thing. You can see that is impossible, for there is no hindering it from taking up these different colored hairs in the workshop that is flying about. Moreover, there are many of these colors got up with acids in them, which would die and the color become flat, to say nothing of the dirt of the hands and the machinery in spinning.

Made-up woollen cloth, intended for milk-white, is cleaned in the best soap, well rinsed in clean water, with a little sour in it; hung up in a hot stove room, and bleached with brimstone burnt under it. Manufactured white woollen cloths, intended for blue white, are cleaned in soap, with Saxon blue drawn off a blue blanket in it—(see page 50)—rinsed with a little sour in the water, hung up in a hot stove, and bleached with brimstone. (See my description of a brimstone stove in page 40.) Woollen goods for scarlet are washed with clean soap, rinsed, and dyed off directly. Rose-color, drabs, and all sorts of reds are cleaned in soap; worsted serge and all sorts of merinos are cleaned in the best



mottled soap, rinsed and put to drain, ready for the dyer when he wants them, which must be immediately after they are cleaned.

As I finished the subject of ungumming, cleaning, and dyeing the skein silk by dyeing the whites, I must leave the wool in the fleece and manufactured with the whites cleaned, dyed, and hung up in the stove room to bleach and dry. And here I must stop for the very same reason I had in stopping at a certain point when treating of the skein silk dyeing—that is, because the same dye-house, coppers, waters, spirits, and drugs are required for the old woollens as for the new.

After carrying the reader thus far, I shall describe how manufactured woollen cloths, moreens, damasks, merinos, and other woollen goods—old or new, made up into garments or in the new pieces—are cleaned, re-dyed, and re-dressed, so as to look as nearly like new as possible.

The trade of dyeing and scouring has come to so much perfection of late, by competition among the trade, that the masters have been put to their wits' end to produce the best work they can, to improve their business, economy being the order of the day. The public, too, are becoming good judges of dyeing ; and it is seen that almost in all cases the dyers and scourers clean, dye, and finish their work so as to make it look as well as new, they become extensively patronized, as may be perceived by the number and respectable appearance of their shops in London and the provincial towns. The business is not the same as it was forty years ago. Since then friction calenders have come into operation ; and in the present day, bed and window furniture of printed cotton can be cleaned and finished nearly equal to new, and woollen damasks and moreens can be cleaned and dressed by machinery lately introduced into the trade equal to any new. Besides, we do not require anything like the time we used to take to dye and clean the work. Everything in the dyeing business is altered for the better. It is true we are worse paid than we used to be, but



this must be taken into consideration, that we take less time to do our work and pay less for our drugs, so we have no cause to grumble. We have more work, for there is not a journeyman dyer to be had in London ; all are in work. Our good season is just beginning, and we do not know where to find men to do the work.

*Cleaning, Spiriting, and Preparing for Dyeing Woollen Cloths, French Merings, Damasks, Moreens, and other Woollen Goods, various colors.*

The night before the woollens are to be cleaned take ten pounds of the best mottled soap melted in the large copper, a fire put under it ready to clean the woollens in the morning. See that the work is properly marked and tacked, and a list made out of the colors they are wanted to be dyed. In the morning put all your woollens on the board, and sort them for cleaning, taking all the light colors first. Order your man to make up two strong soap liquors, with a little pearlash in each liquor, and one thin liquor. Begin with the whites and blues first, with one to three soap liquors, one spirit water, and one clean water after spirit, and hang them up to dry, and they are cleaned, spirited, and dry, ready for dyeing next morning. You will now proceed with cleaning the rest of the woollens, and be sure to have the soap well in them, and put them into a common sour that will taste strong, while the soap is fat in them, and give them one clean water after the spirits. If you have many woollens to clean, you must give them two clean cold waters after the spirits, then fold up and put them on a peg to drain. The work must have time in the spirits to allow the acid to overcome the alkali, and so to turn all the soap that is in the woollens into grease ; on that account your spirits must be pretty strong, and be regularly and well handled while they are in it. Most all dyers clean and dye their woollens off without drying, but I find it more to my purpose to clean, prepare, and dry the woollens, for they are rarely ever un-

even or stained, and there is another advantage, the drugs go further, and I have always a job to put in a man's hands when I am at a loss for one.

Sort your woollens now, and put all up to dry, except the marone merinos, and claret merinos, and all sorts of brown merinos. Clean out a copper that will hold six pails of water, with two pounds of alum, two pounds of copperas, and one pint of muriate of tin ; boil them well in this for half an hour, handling them well over a clean stick all the time. Now get them up on the tenter-hooks in the dye-house to cool, and when quite cold, rinse them in two clean cold waters, and dry them with care. This little copper will not take more than three merino dresses at one time, that is twenty-one yards of merino for this quantity of alum, copperas, and spirits. On this scale there can be one yard, or one hundred yards prepared for dyeing ; of course the less quantity, the less preparation, whilst a larger quantity must have more mordant, and a larger copper. You must dry this work, as I intend it to be dyed in a cudbear copper. There are many other ways of dyeing merinos, marones, clarets, and browns, such as peachwood, camwood, logwood, fustic, &c., after this preparation, but this is a favorite way of mine.

*To clean forty yards of Scarlet Moreens, and forty yards of Scarlet damasks for Re-dyeing.*

Take as much of the best mottled soap as will clean forty yards of scarlet moreen and forty yards of scarlet woollen damask, and cut it into thin shavings in a kettle, tub, or pan ; pour boiling water on it, stir it, and then cover it well over, and give it time to melt in the water, stirring it now and then, still keeping it covered over until the soap is well melted. While the soap is melting, make up a blood warm water, and put a pound of soda in a bowl, and melt it with scalding hot water, and pour this soda into your warm water. Open out all the scarlet moreens and damasks on a board, and first take

the moreens up in your arms, and put them into your soda and water at once; punch and handle them well in this for ten minutes, and then fold them upon the puncher-head, and put them on a peg to drain; while they are draining, you must be careful not to let them touch the ground or work of another color, or they will be stained, and next put the damask in this liquor, punch it well, fold it up, and put it on a peg to drain also. Now make up a warm water, not too hot for the hands, but quite as hot as you can bear to keep your hands in it; melt one pound of soda into this, and one third of the soap you melted (say five pounds), stir it well, and open out your work as you did at first, and put it in this clean hot soap liquor; punch it well and handle it over and over while in this liquor, and still keep punching it about to force the dirt out of it; keep doing so for ten minutes, then fold it up on your puncher-head, and put it on the peg to drain; let the damask follow—do the same with it, put it to drain, and throw this first soap liquor away. Now make up in the punching tub another liquor of soap, soda, and hot water as you did the first; put your moreen in it first, and keep punching and handling it as you did in the first soap liquor, and give it only ten minutes, as before, and fold up on your puncher-head, and put on the peg. Now the damask is to follow as above and turn this soap liquor over into the old soap liquor cistern (see page 19), and give them another warm soap liquor, separately as before, but no soda in it this time. Open out your moreens, and put them in, well handling and punching them for five minutes only, and get them up; you must be quick now as your color is beginning to come off, as you can see by the liquor draining from the peg before; turn this liquor into the old soap cistern, and give them another clean soap liquor, the moreens going first as before; fold up and put on a peg to drain, turn over your soap liquor, rinse your tub and fill it with clean cold water and make it taste well with common sour; open out your work, fat out of the soap as it is, and handle it well in your tub with the com-



mon sour in it; give it twenty minutes in this, folding it up once in the time, and putting it back again in the spirits for ten minutes longer. Now fold up, and put them on the peg to drain, and throw the spirits away, and give them two clean cold waters; fold them up and put them on the peg to drain, and hang them up in a warm room to dry, and they are ready to pick and shake out the ends for finishing, and, when finished, they are ready for delivery to the owner.

*To clean Scarlet Worsted and White Cotton Damask  
Curtains, made up together for Re-dying.*

Before I proceed any further in cleaning woollens, I must explain to my readers the reason why I clean those woollens that have scarlet, crimson, blue, gray, green, and their fringes, by themselves, and never leave them until I hang them up to dry. The greater the care that is taken in cleaning these colors, the less harassed the color that is on them, and the better it is for them in the re-dyeing and drying before they are dyed; it makes them a plumper and a better color than when dyed wet. For instance, when I am obliged to dye forty yards of scarlet moreen or damask, a good bright, bold color, I cannot do with less than a pound of cochineal, but when I dry it after cleaning, I only require to use three quarters of a pound, and it makes a brighter scarlet, so I save a quarter of a pound of cochineal by drying. The next forty yards of scarlet moreen or damask to follow the above in the same scarlet copper, I only require half a pound, but the work must dry first, and to follow another scarlet, or half a pound would not dye it. These white cotton or worsted damasks are to be cleaned every way like all worsted damask, but must be cleaned quicker than the other because, being so thin, the color would sooner start; neither do they want so much cleaning. Dry this also.



*To Clean Crimson Damasks and Moreens for Re-dyeing.*

The scarlet moreens and damasks should always be cleaned and hung up to dry, out of the way, before you begin to clean the crimsons for dyeing. The soap liquors left from the scarlets may be used in cleaning the crimsons; you need not put any fresh soap to these old liquors; but finish cleaning the work with fresh clean soap liquors; spirit and rinse these as you did the scarlets. My next work will be to clean and dye fifty yards of damask, pale blue.

*Directions to Dye fifty yards of White Worsted Damask a Pale Blue or Sky Blue.*

Clean in three clean soap liquors, and spirit them while the soap is fat in them, one water after the spirit, fold them up on a puncher out of the water, and put them on a peg to drain. Clean out your large copper, and fill it up with clean water, and get it on to a boil quickly; when it begins to boil, throw in a handful of alum. Watch your copper, and skim off the scum the alum will throw up to the top as fast as it comes up, or it will drop down in the liquor again. Damp your fire gently, and do not let it come near a boil, while you are dyeing your blues. Scald half a pint of Saxon blue (see page 60) in a clean stone jar, with one quart of water, stir it well with a clean pipe stopper and put it by to settle for a minute; make your copper hardly taste—very little indeed—with common sour (see page 58), and put in half a pint of Saxon blue you have scalded; stir your copper with a clean stick, open out your work and put it into the copper, and handle it well for twenty minutes; take it up and look to your pattern, and give it another half-pint of the scalded Saxon blue, and put your damask back in the copper, and handle for twenty minutes longer. If the work is to your pattern, take it up out of the copper, and make it taste sharp with common sour; give it only ten minutes in this, and get

it on the tenter-hooks in the dye-house to cool; rinse in a couple of clean cold waters, and fold it up on your puncher-head. Hang the work up in a hot or cold room to dry, and when dry, send it to be pressed, and it is completed.

*Another way to Dye the above fifty yards of Damask Pale or Sky Blue.*

Begin to dye your work with a copper of clean cold water, half a pint of alum, scalded in a bowl and poured into the copper, half a pint of Saxon blue, and a table-spoonful of oil of vitriol. Open out your work, put it all into your copper at once, and tell your man to put a fire under the copper, and to mind it from time to time, so that it comes to a scald in an hour. All this while you keep handling your work with your hands in the copper. When half an hour is up, get up your work and give it half a pint of Saxon blue scalded, from the quart stone mug. Put the work back into the copper, and handle it well for a quarter of an hour; by this time it will be too hot for your hands; tell your man to draw the copper fire, throw some dry rubbish on the bars, and shut the copper door. Get up your work for a third time, and give it another half pint of the scalded Saxon blue and a quarter of a pint of oil of vitriol; stir it well, and put your work back for another (the fourth) quarter of an hour, and it is dyed a very pretty, solid, pale blue.

REMARKS.—No time has been lost in dyeing this blue by beginning on a cold copper, for I have dyed it within the hour; next I began my first blue with my copper scalding hot; so there is no difference as to economy. My readers will please to understand that ten yards require no less time than a hundred yards, but a hundred yards wants more dye-stuff than fifty yards.

*Another way of Dyeing Pale Blues on Woollens.*

Put one pint of neat Saxon blue into two pails of scalding water, in a small kettle, and put two pieces of

blanket in it, about a yard square, and put the kettle to swim in a boiling copper, for half an hour; then get it out, and put your blankets to drain over the kettle they were in; turn over the blue that is left in the kettle into the green liquor cistern (see page 19), and well rinse the blue blankets, and put a handful of soda at the bottom of the kettle, and half a pail of boiling water on it to melt it; then add a pail of water to it, and put your kettle in a boiling copper to swim. Now put in your blankets to draw the blue off them, to dye fifty yards of white damask a pale blue. When the blue is all drawn off the blankets, take the kettle out of the copper, put the blankets to drain on a peg, and the kettle under them. When drained sufficiently, make the blue that is in the kettle, drawn off the blue blankets, taste with a common sour; clean out well the large copper, and fill it with clean cold water within two pails of the throat. Melt half a pint of ground alum in it, and put half a teacupful of oil of vitriol, and half your blanket blue. Open out the damasks, take them up in your arms, and put them in your blue copper, and tell your man to put a fire under it, as quickly as he can, whilst you still keep handling your damasks. In half an hour get them up, and give them the remainder of the blue in the little kettle. Put them in for fifteen minutes longer; get them up, and put in half a teacupful of oil of vitriol; put them back again for ten minutes, draw your fire, and get your work up on the tenter-hooks in the dye-house to cool; when cool, give them two cold waters; fold up on a puncher-head, and put them on a peg to drain; then hang up in the drying room, and when dry, send them to the pressers, to be finished—this is a sky blue, one of the finest of our colors, and that from the extract off the blanket.



*Directions to Dye fifty yards of White Damask, Pale or Sky Blue, with Indigo Powder from Balsall Heath Color Works, Birmingham.*

To do justice to this splendid extract of indigo, I cannot do better than give the first three lines of the circular I had with a tin case ; it is as follows : “ Having recently discovered a method of dissolving and purifying indigo, and again concentrating it to a powder perfectly soluble in boiling water, and ready for immediate use,” &c., I have used it, and very good blue it makes. I will now dye these fifty yards of damask blue with it, by putting a teacupful in a clean quart jug, pouring boiling water on it gently, until I have filled the jug, stirring it well with a pipe stopper all the time. I then put it on a shelf out of the way, and it is ready for use.

Clean out the big copper, and make it boil, with pure clean water ; open the copper door, and damp the fire. Put in half a pint of ground alum ; skim off the skum that the alum will throw up, and put in half a small teacupful of oil of vitriol and a pint of Balsall-heath blue, scalded in the quart jug on the shelf. This done, open out your work, and lift it into the copper ; give it twenty minutes, and then get it up ; put in half a pint more, of the same blue ; then give twenty minutes more, and get them up, and give them the remainder of the blue and a teacupful of oil of vitriol in your copper ; stir it well, and put in the work again, and give it twenty minutes more in this liquor, handling it all the time. Now get them up on the hooks in the dye-house to cool ; and when cold, give them two separate cold clean waters ; fold up out of the waters, and hang up to dry, and they are ready for finishing.

*To Clean and Dye Moreens Pale or Sky Blue.*

There is no difference in cleaning and dyeing moreens pale or sky blue ; the only difference is in the finishing. Moreens, when dyed, are only a plain, thick stuff,



not fit for use in that state; but when they are watered, striped, or embossed, they look as well as new, and pay the customer very well for having them re-dyed.

*To Dye and Clean Blue Worsted and Cotton Damask Furniture, and Table Covers of Blue Worsted and White Cotton.*

Blue Damask furniture and table covers are cleaned and dyed exactly the same as the other blues, only we use very little acid in the copper we dye them in. We do not let it taste; if it did, it would rot the cotton. We rinse and stiffen them directly we have dyed them, and hang them up to dry.

*To Dye Waterloo Blue or Moreens and Damask.*

Clean your copper, and make it boil; and for twenty yards of moreen or damask, scald in a brown stone mug half a pint of Saxon blue; put a handful of alum in your copper, half a pint of liquid ammonia, and a teaspoonful of common sour. Put in half your Saxon blue, open out the work, and handle it in the copper for twenty minutes; get it up, put in the remainder of your blue, and give it twenty minutes more. Get it up, and hang it on the tenters in the dye house to cool; when cold, rinse it in two clear cold waters, and hang it up to dry.

REMARKS ON SAXON BLUES.—This Waterloo blue would dye after the pale blues; but it being a separate blue from the pale blues and the sailors' blues, I prefer using it by itself. When we dyers commence with our pale blues, we follow with our darker pale blues, and take them up, and give them to our man to rinse and get up. More Saxon blue in the copper is requisite; and so we go on, lot by lot, until we come to a black. We can begin at a copper with clean water only in the morning, and dye the sky blues; then the full pale blues; next the fullest pale blue; then the Waterloo blue; and by adding cudbear only to the copper, make

dark blues, and darker still, down to a black. Saxon blue will accomplish all this, if well studied by the dyer. Now we will work a pale blue copper another way. After you have dyed your Waterloo blue, it is a capital copper for grass greens, with ebony. Take them up, and fill your copper out of your old green slate cistern, and dye your visible and invisible greens with the one liquor you began the pale blues with, before you throw it away.

*To make a Woad Vat, that is a Blue Vat—a Vessel to Dye Blue Woollens or Vatted Blue.*

You must have a wooden vat made, of yellow deal two inches thick, six or seven feet high, six feet wide, and eight feet long, well morticed together; it must be very strong and water-tight, and buried three feet in the earth on a brick and cement bottom. A four inch wall, joined to the bottom, must be all round it, on a level with the floor, that in case the vat should leak, there would be no means of escape into the earth. There should be wrought iron girders put on the four angles outside, to keep it firmer. So with the bricks, cement, earth, and iron, you must prevent its leaking.

The next thing to provide is a portable wrought-iron frame to drop nearly to the bottom of the vat, to keep the work from touching the drugs. A corded netting, made tightly to fasten to the four sides of the iron frame; and when the vat is fit to work, this frame is generally lowered down, and made fast to the sides by cords. A rake is used to rake it up from the bottom, and a frame tented, to fasten the edges of the cloth inside of, and then dipped down into the vat. The cotton blue vat is made the same way, with rake and frame alike.

There are regular vat-makers for brewers, distillers, and dyers, and these are the best men to apply to. Some dyers have the bottom made of lead and the sides copper; some have them made with cement, sand, and bricks. There are also vats made of tallow, oil, or wine

casks, for skein worsted yarn, shifted from one cask to another, until the blue required is obtained. These are mostly dry vats, no woad or pastel being in their composition; woad is too bulky for small vessels.

### *Pastel, or Woad.*

The pastel is a blue paste formed by the putrefaction and reduction into a kind of compost of the chopped stalks of the *isatis*. The plant, mowed and dried quickly in the sun, is bruised in a mill, and then laid in heaps, which are slightly sprinkled with stagnant water, and guarded against the sun. The fermentation is developed in them after a fortnight. These heaps are opened; they are bruised, and mixed; round balls are then formed of them, which are dried by exposing them to the wind and sun. When heaped upon one another, and sprinkled with putrefied water, these balls become heated, exhale ammonia, dry, and are reduced into a blue, which is sold in commerce in this state. It is in the Departments of Gard, Avignon, and Dordogne that this color is prepared in this manner; in Calvados and the lower Seine one of the inferior quality, called woad, is prepared. Astruc has treated the *isatis* like indigo plant, and he says he has extracted from it a powder of an indigo color. Mr. Green has described a process practised in Germany for changing by fermentation the *isatis* into indigo. This process has a great analogy with the process for the real indigo (see pp. 60, 61). A strong fermentation takes place in the steeping tub; much froth is formed; a blue pellicle, of a gold color at its surface, presents itself; and, like indigo, the liquor has to be beaten, to separate the color from it. It is then dried in the shade. It is like the indigo plant, but is less delicate and rich. It is put in vats with indigo and madder, to dye a never-fading dark blue on wool, and was called woad-vats before indigo was known, and will never lose its name at Languedoc. Turnfoil is steeped with rags, and in the fermentation the rags suck



a blue color from the turnfoil: the color is then taken from the rags by soda.—Fourcroy on Coloring Matters, vol. viii. p. 87.

*Directions to make a Pastel or Woad Vat—To Dye Wool Royal Blue, in the Fleece or made up.*

Fill your copper with water, and put in it eight pounds of madder. Boil it well; put a bushel of bran into your empty blue vat, and break well four bushels of pastel balls, dry, on the top of the bran. Keep the madder boiling all this time; draw the copper fire and turn the boiling-hot madder liquor into the blue vat on the woad and the bran, well stirring it all the time. Put the lid on the vat, and cover it close, to keep the steam in, for six hours. Open it, and then rake well, and throw into it a bushel of slacked lime; well rake from the bottom, and all round it, for ten minutes; cover well over again, and leave it for twelve hours, raking it four times in that time. Rake it each time quickly, and cover over directly, so as not to let it cool too soon.

Boil up eight pounds of ground indigo, two pounds of madder, a pailful of bran, and four pounds of pearlash, in the big copper (see page 18). Boil these well for an hour, and keep well stirring all the time. When the hour is up, draw all the fire, and shut the door; and put into the copper two pounds of raw lime finely slacked in powder, so slowly that it will occupy one hour. Now uncover your vat, and turn over your indigo copper into it (the first copper was the woad copper), and keep raking it all the time. Now cover it over, and leave it until it gets cold, raking it every four hours; still keeping it covered; and it is fit for use. You must renew it every time it is worked.—Colbert's work on the Art of Dyeing Wool.

REMARKS.—Woad, or, what is much stronger, pastel, always dyed the blue woollens of Europe until indigo was brought here. M. Colbert was one of its principal opponents, as afterwards he was one of its principal sup-



porters; and his blue vats have never been surpassed to this day.

*To make an Indigo Vat for Dyeing Woollens Royal Blue.*

Fill your large copper with water, and get it into a boil; while it is yet cold, put into the copper twelve pounds of ground indigo, and eighteen pounds of pearl-ash, three pounds of madder, and one peck of bran; keep raking up these drugs all the time it is coming to a boil—never leave them. When the copper comes to a boil, open the door and damp the fire gently, so that it will simmer for an hour and a half. Still keep to your copper, and do not leave it for a moment; keep raking it all the time it is boiling, lest it should stick to the bottom. When your time is up draw your copper fire out, open your copper door, and get your cistern ready to run the liquor in your copper into it. When all the liquor that is in the copper is turned into your vat, fill it up with clean cold water, and it is fit for use. It must be helped after it is worked.

REMARKS.—You must soften with a little ash the clean water you want to fill up your vat with at any time. When this vat is streaky, like mottled soap, it is fit for use.

*Fuller's Earth used for cleaning the Dyeing Stuff out of Dyed Woollen Cloths and thickening at the same time.*

Fuller's earth is taken from pits at Nutfield, near Reigate, Surrey. It is used for cleaning the dye-stuff and grease out of the woollen fabrics after they are dyed. The place they are taken to be cleaned at is called the Fulling Mill. There is a large vessel filled with fuller's earth and water, and the pieces are opened in this, so that the earth may be regular over the work; the mill is set going—it is always a water-mill—and large lumps of wood come slap on it, up and down, until it is both

thickened and cleaned at the same time. When all the grease is out, they mill the earth out of it in the same manner, the water running through the mill, and the pieces of wood slapping away at it until all the earth is out; it is then taken to the tenter ground, stretched, and left to dry.

*To Dye Fast Gray on Moreen, Damask, Merinos, China, Crape Shawls, French Delainés, and Silk, of all sorts, for either New or Old Work, and Ladies' Merino Dresses.*

Clean your work well in soap, spirit it out of the soap, and give two clean waters; fold up, and put it on the peg to drain; sort your work, and after sorting, put by safely that part which is not going to be dyed at present.

Give the work a pink dye tinge, with cochineal, in the copper, with scarlet spirits; boil it in this gently one hour; then take it out to cool. Afterwards rinse in two separate clean cold waters; fold up, and put it on a peg to drain.

Clean out this copper, and fill it up with clean cold water: melt a little alum, stir it up, and put as much blanket blue (see page 50) in your copper as a part of what you intend to give them to dye them a good full gray. Put as much common sour in your copper as will make it taste but slightly. Put in your work, and tell your man to put a fire under your copper at the same time: this work ought to be blue in an hour. Handle it well for twenty minutes; get it up and give it more blue; give it twenty minutes more; get it up, and give it as much blue now as you intend to give it, with a little more acid, and put it back into your copper for twenty minutes longer. During these operations, your copper is getting on to a scald; when it comes to that point, draw your fire; for should your copper only simmer for one moment, your blue is spoiled. In dyeing blues and grays, your must bear this caution in mind. Now get them up to cool, and give them two separate clean cold waters,

and put them on the pegs to drain; tell your men to throw away the blue copper you have been using, and get it on with clean water. And now begin to make them a fast gray, that nothing yet known will take out.

Hang them up by the selvage, very straight, in a stove room. Put roll brimstone at two ends of the room, in a small iron pot, to stand on a couple of flat bricks or tiles, to keep the pot from the floor. Put a small piece of red-hot iron into each pot, and fill the pot with roll brimstone, and see that they burn before you leave the room. Now close all the windows, doors, fire-place, key-hole, under the door, and make the place air-tight, and let them be in this brimstone room for twelve hours. Mind—if the brimstone escapes in the slightest degree, the work will be uneven. When the twelve hours have expired, open yours doors and windows, and see that your work is a fast gray pattern; if it is, and is dry, take it down; if not, keep the windows and doors open until it is dry. When dry, take it down, fold it, and it is ready for finishing; should your gray moreens be too dark for your pattern, take them into your dye-house, and give them a blood-warm water, they must be thoroughly dry first, and then hang them up in your stove room. Put a red-hot piece of iron in your pot, the roll brimstone on the top of it, and close your windows and doors as before, and there leave them for the night; in the morning, open your doors and windows, and compare your pattern with your work—it is sure to do now; if they are dry, take them down, fold them, and they are ready for finishing. One yard or one hundred yards can be dyed this way.

*To Dye China Crape Shawls and Silks a fast Gray.*

Clean your silks, fold them up out of a thin soap liquor, get on your small copper, and dye them French white, with a little scalded cudbear and soap in the copper. Give your silks a simmer for ten minutes, get



them up, rinse, and dye them in spring water, alum, and blue, off a sheet of full gray. Give them one cold water, wring them up, shake them well, hang them up in the brimstone room, put two pieces of red-hot iron in the iron pots, see that they burn before you leave the room, close all the doors, &c., and leave them for the night; in the morning, see if your silks are to your pattern; if they are, take them down if dry, but unless they are, they had better stop in the room all day, and keep the windows open; be sure to take them down before night. Damp, brush, and finish them, and they are done. The China crape shawls are rolled.

REMARKS.—You can dye any gray you like this way, and brimstone all the different colors in the same room. As you sow so you reap in this affair. Whatever color you put them up in the room to brimstone, that color they will come down, as fast as a rock, but lighter.

*To Dye Merinos, Damask, Moreens, and Ladies' Dresses Gray.*

A FAST COLOR.—Clean your work and give it the woad vat, when it is very new, or when it is nearly worked down; they must be well rinsed out of this, and dried in a hot room.

NOT A FAST COLOR.—Clean your articles and give them a copper with cudbear and Saxon blue in it; they must be boiled well in this for an hour. Get up and cool. I always like to return them in the copper with a little more blue, and a boil for a few minutes, then get up, rinse and hang up.

NOT A FAST COLOR.—I use liquid ammonia instead of cudbear with my Saxon blue—in every other they are dyed alike.

*Directions how to Prepare and Dye Green Woollens.*

Green is a compound color, made from Saxon blue as one sort, and the blue vat as the other. There are other



blues we use to dye green, but these are the ones generally used with different sorts of coloring substances that will dye yellow; and you will see from this explanation, that blue and yellow put together in the same copper with the woollens make them green, and my business now is to explain how to do it. In the first place, you must make a spirit to work in the copper with the alum greens.

*To make a Solution of Tin, to use in the Copper with Old or Young Fustic, and Chemic Blue to Dye Green Woollens.*

To every pint of the best oil of vitriol put half a pint of water; put the vitriol first in the jar, then the water, then the vitriol, then the water, and so go on until you make any quantity you like. When the water and vitriol is mixed together, weigh it, and to every pound add one ounce of grain tin, and one ounce of bay salt; the tin and the salt is to be put in a little at a time. When all the salt and tin is in the liquor, put by in some dry place, with a stopper on it, and it is fit for use.

*To Dye Blue, White, or Pale Drab, Moreens, Damask, Bed and Window Curtains, Ladies' Merino Dresses, and other Woollen Goods, Pale Green with Weld.*

Clean your woollens well, spirit them out of soap, rinse in one clean cold water, fold up, and put them on a peg to drain. Clean out your large copper, and fill it with clean water, and get it on to a boil. Put in four pounds of ground alum, and one pound of crude tartar; handle in your work, and boil them well in this for one hour, handling them well over a stick all the time they are in the copper. When the hour is up, open the copper door, damp the fire, and take the work out of the copper, and cool it. When cool, give it two clean waters. Clean out the copper, and get it on to a boil, with half a bundle of weld in it, and four ounces of soda,

and boil it well until the weld falls to the bottom of the copper; then take it out, for all the color has been taken out of it, and it may be thrown away. Now begin and dye your work.

Scald half a pint of Saxon blue in a quart stone mug, stir it well, and put it to settle. Now put in your copper half a pound of tartaric acid and half a teacupful of scalded blue; then take your palest greens first, open them out, and boil them for twenty minutes. Now see to your pattern, and if you have enough dye-stuff in your copper to dye your work, give them a good boiling for half an hour longer, and get them up to cool, and tell your man to rinse them well, fold them up, and put them on the horse to drain, and hang them up in a warm room to dry, and when dry they are ready for finishing.

The next green you dye is a dark pale green. Put in your copper another half bundle of weld, and boil it as you did the first half bundle, without the soda; when the weld drops to the bottom of the copper, take it out, and put in another half pound of tartaric acid, and double the quantity of blue you gave the first lot. Now open out your work, and put them in the copper, and dye them in the same way you did the first lot.

REMARKS.—By adding fustic, alum, and blue to this liquor for another, and then adding turmeric and blue for another lot, and by a little manœuvring with your yellows and blue, you can produce a variety of shades before you throw it away.

The weld is a plant that grows upon high dykes, with a long stalk to it. In France they cultivate it, and dry it, and make bundles of it, like bundles of straw. I do not know the reason it is not cultivated in England and Ireland, but this I know, it grows wild in both countries, for I have gathered and used it; it is as good as the French weld, yet the French have the trade of growing it and selling it to us—it is a mysterious fact.

*To Dye Merino Dresses, Damask, and Moreen Window Curtains, and other kinds of Woollen Goods, with Fustic and Chemic Blue, without any Preparation—Pale and Grass Green with Young Fustic.*

Clean your work with soap, spirit, rinse it, and put it on a peg.

Put one pail of young fustic chips in your copper, boil them well for ten minutes, open your copper door, and put one pound of ground alum, in the copper, and a tablespoonful of oil of vitriol, and half a pint of your scalded Saxon blue. Stir these well with a clean stick. Open out your work and put it in the copper, and boil it well for half an hour. See to your pattern, and if it is a pale yellow green, boil them well for twenty minutes longer, and get on the tenter-hooks in your dye-house to cool, and give them to your man to rinse well, to take the chips out of them, and hang up to dry. A number of shades can be done in this copper, before you come to the grass green. For the grass green you will put in half a pail more fustic, and a pound of turmeric, and a pint of your scalded blue; open out your work, and handle it well in your copper, for twenty minutes; now see to your pattern, and if it is not as you wish, get it up, and give it another pint or half pint of your scalded blue, whichever you may think it wants. Put them back now in the copper, and boil them well for half an hour longer, and take them up to cool, rinse, and fold up, and put them on the peg to drain, and when drained, hang them up to dry, and they are ready for finishing.

REMARKS.—I am obliged to express at times young fustic, that means the young branches of the tree, and old fustic is the trunk of the tree.

*To Dye Woollen Goods of all Descriptions Green—Prepared first with Alum and Tartar.*

Clean your work well in three or four good soap liquors; let the last be a thin soap liquor; spirit your



work directly out of the soap. You must give them plenty of time in the spirits, and see that it tastes sharply before you take your work out of it. The reason I mention this, is that in cleaning garment and furniture work at the beginning of woollen dyeing (see page 123) I took all my woollens down in the morning and made a day's work of them; and as I cleaned them I had them dried, and when dry folded, the list made out, and I was not obliged to dye them all at once. In this way making a cleaning day for the woollens, makes it come cheaper. For one color and soap liquor follows another, and there is no waste.

Clean out your copper, and get it to a boil with clean water, put four pounds of alum in it, and one pound of crude tartar; open out your merino dresses, moreens and damasks, and boil them well in this for an hour. Keep handling them well all the time; if you have more woollens to dye green than the copper will hold, prepare the damask first, moreens next, and the ladies' dresses next, any other woollens last. The work now must be taken out of the copper, and hung up on the tenter-hooks in the dye-house to cool, and when cool, rinsed in two separate clean waters, and put on the peg to drain, ready for dyeing. Throw this copper of liquor away, clean it out, fill it with clean water, get it on to a boil and put a pail of old fustic chips in the copper, half a pound of tartar, or a little common sour in your copper, with half a pint of scalded Saxon blue, open out your damasks, put them in the copper, and boil them well for twenty minutes. Now look to your pattern, and see if you require more blue, if you do take your work out of the copper, and put as much blue in as your pattern requires. Put them back in the copper, and boil well for half an hour; take them up again, and put as much oil of vitriol in the copper as will make it taste, barely taste, I mean. Put the work in the copper again, and give it a good boil for ten minutes, damp your copper by filling it up with clean cold water, and hang up your work to cool out of the copper; rinse well in three cold waters, fold up, and put



on the peg to drain, and hang them up to dry. The next lot of greens to be dyed in this copper must have more dye-stuff put in, that is what the dyers call helping it with more dye-stuff, and so we go on dyeing lot after lot—ladies' dresses and furniture, until we go down to the darkest shade of green on woollens.

REMARKS.—The reader very naturally would like to know how many pounds a pailful of fustic weighs, and what is the price of it. The price of the best Cuba fustic is sixteen shillings the hundred weight, ready for use, and a pailful of fustic chips weighs seven pounds, and at sixteen shillings the hundred weight, it costs one shilling. Young fustic is dearer. At the end of this book the reader will see a list of the drugs and chemicals used by dyers, as well as a list of prices of silk, wool, and cotton in their raw state.

*To Dye Bed and Window Furniture, and Ladies' Merino Dresses any Pattern, Green with Ebony, without any previous preparation.*

We shall proceed to dye fifty yards of damask green, first, for that is about the number of yards there is in a set of good-sized drawing-room window curtains. If they are green for re-dyeing the same color again, they must be cleaned with great care. Clean and re-dye fifty yards of green moreens with these; they are to follow the green worsted damask in the cleaning and dyeing in cleaning for re-dyeing.

Disturb the color that is on them as little as possible, give them a strong spirit out of the soap, and a cold water after, and re-dye them with fustic or ebony at once, that is, when taken out of the shop to clean and re-dye, they should never be left until cleaned, dyed, rinsed, and hung up in the drying-room to dry, but knocked off at once.

To re-dye this fifty yards of green worsted damask curtains, have a copper that will hold twenty pails of water, get it on to a boil, and put half a pail of ebony in

it, and boil it for five minutes; now open the copper door, and put one pound of alum in the copper, stir this well, do not leave until it settles down. Put in your copper a small half of a teacupful of oil of vitriol, and half a pint of your scalded blue, and open out your work, and put them in the copper, and boil them well for half an hour, and compare the pattern with your work, and if it wants no more color, keep it in for another ten minutes; then get it up, and make your copper taste gently with common sour, and a little more blue; put your work back in the copper, and give it another boil for ten minutes, and it is done. Open your copper door, and fill the copper with clean water, and take it out of the copper, cool, rinse in three waters, fold up, and hang up to dry, and when it is dry, finish it, and it is done.

We have now fifty yards of green moreen that followed in the cleaning; for these we will put in the copper the liquor the damask left, another half pail of ebony, half a teacupful of oil of vitriol, and half a pint of scalded Saxon blue—no alum, it would make the work clammy. We will dye these exactly the same way as we dyed the damask, but the copper not being so bright a color for a second lot as for the first, we must brighten up the yellow by giving it half a pound of turmeric, and a little more spirits, a quarter of an hour before they are finished; I do not boil them in this, but when the time is up, take them out of the copper, well rinse in three clean waters, fold them up, and hang them up to dry, and they are done. I have now cleaned and dyed one hundred yards without leaving off.

*Directions to Dye Ladies' Merino Dresses and other Woollen Fabrics any Green, without any previous preparation for the color.*

Take your dresses out of the shop, and your list of the different colors they are to be dyed green, sort them, and clean the lightest first, and so go on until all your

woollens are cleaned and on your pegs; now sort them, and take the lightest greens first. Merinos for ladies' dresses take more dye-stuff than moreen or damask curtains. So begin with two merino dresses, in a fifteen-gallon copper first; you can dye one or one hundred French merino dresses in an eight-gallon copper, but they must be done one at a time, as eight gallons is as little a float as you can have to dye a merino dress, and it is quite enough room to dye it in. We can dye a dozen at one time, but we must have a copper in proportion to the quantity; the dyer's maxim is all one color—it takes nearly as much time to dye one dress as a dozen.

We will begin with pea-green first. Put a bowlful of ebony in your copper, make it boil well for a minute or two, make it taste with a little sour, and a table-spoonful of your scalded Saxon blue; this will dye two dresses pea-green. By boiling and handling them well over a stick for forty minutes, when your time is up, take them out of the copper, and hang them to cool out of your way. Put half a pint of your scalded Saxon blue in your copper, and dye two more merino dresses pale blue-green, quite an opposite color to the first two dresses you dyed. Boil them well in this copper for forty minutes, and take them out of the copper, and hang them on the tenter-hooks to cool out of the way, and they are dyed. Tell your man to rinse these four dresses well in clean waters, and hang them up to dry. Now put one half pail of ebony in your copper, and half a pint of your scalded blue, and a little more sour, and take two more dresses and dye them a grass green. Give these two dresses one hour's good boiling and good handling, and get them up on the hooks to cool, and tell your man to rinse them, and hang them up. Put another half pail of ebony in your copper, and one pound of turmeric and one pint of scalded blue, and take two more merino dresses, and dye them myrtle green. You must boil them well in this for an hour, get them up, and give them another pint of blue, and a good boil for forty



minutes, and take them up and cool them on the hooks in the dye-house, and tell your man to rinse them, and hang them up to dry, and they are done.

REMARKS.—There are four sorts of ebony—the chips, the ground, the sawdust, and the turner's shavings. The latter I consider the best, and I always have it in preference to the others. They are the shavings which the turners make in their ebony work.

*Directions to Dye Green with Quercitron Bark, Woollen Damasks, Moreens, and Worsted Fringes.*

Clean, rinse, and spirit your work, and put in on the peg to drain. Put four pounds of alum into the large copper, and one pound of crude tartar; open out your work, put it in the copper, and boil well for one hour; take up and cool, rinse in two clear waters, and throw your liquor in the copper away, rinse it, and get it on to a boil with clean water. Now put seven pounds of quercitron bark into a very open cotton bag, and boil it well for half an hour; then take the bag out of the copper, and put in half a pint of muriate of tin, and half a pint of scalded blue. Put in your lightest damask or moreens first, boil well for forty minutes, see how you are for your pattern—if it wants more blue, get them up, and add it, and give your work a good boil for twenty minutes. Get up to cool, rinse well in two cold waters, fold up, and put them on the peg to drain. When drained enough, hang them up in the drying-room to dry, and when dry, they are ready for finishing.

*To Dye Drab in Ladies' Merino Dresses, and Bed and Window Curtains of Damask, Moreen, and other Woollen Manufactured Fabrics.*

Drabs, stone colors, fawns, and vaunterins require no previous preparation to take the dye. These light colors are very trying to a dyer who has a pride in his



work. There are a number of colors, and I will begin with a light drab first.

Take your work and clean it carefully, and put it on the peg to drain, and for forty yards of woollen damask furniture put in your copper one pound of sumach, two ounces of cudbear, a table-spoonful of your scalded Saxon blue, and half a pint of oil of vitriol; have two very clean sticks on your copper ready for use. Take a clean white saucer, and take nearly the full of it of the now drab liquor out of your copper, and compare it with your pattern, and you must add dye-stuff to your liquor in the copper until you get it to the color of the drab you want to dye. You can judge that by taking a saucer nearly full of the liquor out every time you put fresh drugs in. You must mind your saucer is nearly full, or you will not get the right shade; and that your copper is boiling all the time you are making your drab liquor. Now you have what drugs you want in your copper, open out your damasks, and put them in the copper, and boil them well for one hour, handling them well over the sticks all the time; when your time is expired, fill up your copper with clean cold water, and take your work out of the copper, and as you take it out, hang it on the tenter-hooks in the dye-house to cool, and tell your man to rinse them well, and hang them up in the drying-room, either warm or cold will do. Drabs are very strong colors; light drabs are very good wear, for in the wearing they always get darker, whether in dresses or in furniture.

The drab damask is done now and hung up. The same copper will dye fifty yards of moreen with an addition of drugs for these fifty yards. Put in half a pound of sumach, two ounces of cudbear, one table-spoonful of your scalded blue, and half a pint of oil of vitriol. Stir these well, and all the time keep your copper boiling. Take your white saucer again, and test your liquor with your pattern; if your liquor is to the color of your pattern, begin and dye your moreens; if not the color, put more drugs till it is. Open out your work,

and put it in the copper, and boil it well for an hour, and keep handling it well all the time with the sticks; never leave your work for a minute, or let it go off the boil. Now your time is up, fill your copper with clean water, and hang up your moreens on the hooks to cool, and tell your man to rinse and hang them up, and they are ready for finishing.

The dyer can do a number of drabs in this copper before he has done with it; he must mind not to use any more sumach, but its place may be taken by either boiled fustic or boiled ebony liquor. As sumach is a very bad dye-stuff for animal substances, I get out of using it when I can, preferring fustic and ebony. For drabs you must not put bowlful of it in your copper at a time, the saucer you have for trying the liquor is quite big enough. Just to give an idea how to use these dye-stuffs, I will charge the copper for fifty yards of moreen or damask for a regular drab, not too dark nor too light, but between both. Put in four ounces of cudbear, four saucersful of ground ebony, half a teacupful of scalded Saxon blue, and half a pint of oil of vitriol; put the work into the copper, boil it well for an hour, then take it out, rinse, and hang it up, and it is done. Thus the ladies' merino dresses will follow in this copper after dyeing the damasks and moreens. Supposing there are four ladies' dresses for stone drab: put in this copper four ounces of cudbear and a quarter of a pint of scalded Saxon blue, and the same quantity of oil of vitriol. Get your copper on to a boil, and put your work into the copper, and boil it well for forty minutes. Now fill your copper, and take your four dresses out, one after the other, and hang them on the tenters to cool; compare them with your stone-color pattern, and you will find you want as much more blue as you gave them at first; put them in the copper again, and boil them well for forty minutes. Damp your fire, fill up the copper with clean cold water, take out your dresses, one by one, hang them on the tenters in the dye-house to cool, throw away your liquor, scour out your copper, fill it up with clean cold water,

get it on to a boil, and, while it is coming on, rinse your stone-color merinos that you have just dyed in three clean cold waters, hang them up to dry in a warm or cold drying-room, and, when dry, they are ready for finishing.

*To Dye Ladies' Dresses Pale Blue, French Merino, Drab, and a Light Drab, and a Merino Shawl Middle to Re-dye.*

Clean the merino dresses and the shawl in clean hot soap liquor, so as to take the blue off even in the cleaning. Take out of a hot thin soap liquor, and spirit it in clean cold water out of the soap, and give it one cold water out of the spirit, fold it, and put it to drain. Clean out a copper that will hold nearly six pails of water, get it on to a boil, and put into the copper half a pound of sumach, one ounce of cudbear, a teaspoonful of scalded chemical blue, and half a small teacupful of oil of vitriol; have the copper boiling and put in the merino dress and the shawl, boil them well in this for an hour, handling them well over your clean stick all the time. When your hour is up, take the dress and the shawl out of the copper, and cool them at the same time. Now rinse them in two clean cold waters, and hang them up to dry, and when dry, damp, brush, and press them.

*Directions to Dye Two Ladies' Merino Dresses Fawn-color.*

These dresses are now a light drab. Clean them well and put them to drain. Clean out a copper that will hold four pails of water, make it boil, and put into it four pounds of fustic, two ounces of cudbear, and half a teaspoonful of scalded blue, and a tablespoonful of oil of vitriol. Put your merino in, and boil it well for an hour, handling it with a stick all the time. When your time is up, get it up to cool, and put in a little more sour, and a teaspoonful of blue in this copper, and put in the other dress, and boil it for an hour. Get it up



to cool, and rinse both dresses in a couple of waters, and hang them up to dry, and finish.

*To Dye fifty yards of Drab, Moreen, and fifty yards of Worsted Damask Fawn-Color.*

As I intend to dye drab moreens fawn first, I will let them go first in the cleaning. They must be cleaned, spirited, and rinsed in one clean water, folded up, and put to drain.

Clean out the big copper, and get it on to a boil; put in your copper half a pail of ebony, four ounces of cudbear, and half a pint of oil of vitriol, and a tablespoonful of scalded blue. Boil your drugs for five minutes, and open your copper. Now put your moreens in, and tell your man to make the copper boil well for a good hour, and then get them up to cool on the tenter-hooks in the dye-house, and tell your man to rinse them, and hang them up to dry, and when dry they are ready for finishing.

The next lot is the fifty yards of worsted damask. No addition of drugs is requisite for these, except a teacupful of oil of vitriol. Boil well in this for one hour, get them up, rinse them, and, when dried, they are ready for finishing.

*To Clean and Dye two Ladies' Merino Dresses Sage Green and Olive—the Sage is any Light Color, and the Olive is now a Black.*

Clean, spirit, and rinse the two dresses, and put them to drain. Clean out a small copper that will hold four or five pails of water, and when it boils put in the copper two ounces of cudbear, eight ounces of sumach, one pound of ground fustic, a tablespoonful of scalded blue, and eight ounces of white argol, and before you put these drugs in your copper, make it taste with common sour, then put in all your drugs, and make them boil well for five minutes, well stirring them with the clean



stick you intend to use in dyeing your dress all the time. Now open out your dress, and handle it well in your copper for one hour, boiling it well all the time, and never leaving it until you get it on the tenter-hooks to cool out of your copper. and we will presume it is on the tenter-hooks cooling out of your way. The black merino for olive is next to follow in your copper; for this black merino dress you will put in your copper a good half teacupful of oil of vitriol, stir it well, open out your merino, and handle it well over your stick all the time; look to your fire, for your copper must boil well. Your time is up now, get it on your hooks to cool, and if it is an olive that pleases you, it is done, but if not what you want, put in this copper one pound of ebony, one pound of turmeric, eight ounces of argol, and a tablespoonful of scalded blue, and boil the merino in this for an hour, and the black French merino will be dyed a very pretty olive. Now you have done with this copper, tell your man to throw its contents away, and fill it up with clean water, and while the man is doing this, give your merinos three separate rinsing waters, and hang them up to dry, and they are ready for finishing.

*To Dye a Lady's Black Merino Dress Fawn-color.*

Clean this dress in three good hot soap liquors, with soda in each liquor, spirit directly out of soap, with one cold water after; clean out a copper that will hold about five pails of water, make it boil, and put a teacupful of oil of vitriol in it, stir it well with a clean stick, and handle the merino in it for twenty minutes, or half an hour; it must be well handled, and not left for a moment. The success of the color will depend on the handling. When the half hour has expired, get your merino out of the copper, and rinse it in one clean water; fold it up, and put it on a peg to drain. Throw away the liquor that is in the copper, and fill it up with clean water; make it boil, and put into it one pound of argol, one pound of ground fustic, two ounces of cud-

bear, and eight ounces of turmeric; boil your merino again half an hour in this, take it up, and give it half a teacupful of vitriol. Stir it well, and put the merino back in the copper, and handle it well for half an hour, and take it out of the copper, cool it, and rinse it in three separate cold waters; put it to drain and hang it up to dry, and when dry you will see it has been changed by this simple and not expensive process from a black to a permanent and good fawn-color that will stand cleaning, when dirty, in good hot soap liquors, and the color will improve by the soap.

*To Dye Two Black French Merino Dresses Grass Green and Myrtle Green.*

Clean, spirit, and rinse your two merinos, and boil them with a teacupful of vitriol each, one after the other; each is to have one hour in the discharging copper; what I mean is, they are to be boiled separately, the grass green first, the myrtle green last. When they have had an hour in the copper for each dress, rinse them in one clean cold water, and throw away the liquor in the copper; rinse it out, and get it on with clean water. Now put in the copper for the merino that is for grass-green four pounds of ground ebony, half a pint of scalded Saxon blue, and a tablespoonful of oil of vitriol. Put your merino in this liquor and boil it well for half an hour, and when the time has expired, take it up and see if it will be blue enough for your grass-green pattern; if not, give it half as much blue as you gave it at first, and give it another boil for a good half hour, and get it up, and hang it to cool out of your way. Proceed with dyeing the black merino for myrtle green in this copper. Put in one pound of turmeric, and one pint of your scalded blue—nothing else. Boil your merino well for one hour, take it out and cool it, and compare it with your myrtle green pattern; and if it agrees, throw the liquor away, and fill it up with clean water. Now rinse these two merinos well with three

clean waters, the grass-green first, then the myrtle. Put them on the peg to drain, and when drained, hang up to dry, and when dry these two blacks will be pretty greens, and ready for finishing.

*To Dye Two Black French Merino Ladies' Dresses, one Claret and one Rappee.*

Get a copper that will hold four or five pails of water to a boil, and put into it a teacupful of oil of vitriol; open out your black merino for claret, and boil it well in this for half an hour; take it and cool it, rinse in two clean waters, and put it to drain. Make no addition to this copper, but boil your black merino for rappee well in it for forty minutes; then take it up to cool, rinse in two cold waters, and put both these merinos out of your way to drain on a peg. Now throw away the liquor in your copper, fill it up with clean water, and make it boil; then put into it one pound of alum, and half a pint of muriate of tin, open out the merino for claret, and boil it well in this for half an hour; get it up and hang it out of your way to cool. Then boil the merino for rappee in the same liquor for forty minutes, making no addition of drugs for it. When your time is up, take your merino and hang it to cool on the tenter-hooks. Throw away the liquor in the copper, scour it well out, and fill it up with clean water. While it is coming to a boil, well rinse your two merinos in two clean cold waters, put them on a peg to drain, and they are ready for dyeing. Now put two pounds of the best cudbear in your copper, and take the merino for claret first and boil it well in it for half an hour; then take it up, hang it out of your way on the hooks to cool, and it is dyed. Make no addition to your copper of any drugs, but put the merino that is for rappee in it, and boil it well for a quarter of an hour; then get it up, and melt half a pound of copperas in four pails of water, and handle it in this for twenty minutes; get it up and rinse it in two waters, and put it to drain. Make your copper boil, put



the last merino back into it, and boil it well for half an hour. Then take it out of the copper, and the two dresses are dyed. Rinse the two dresses well in two clean cold waters, the claret merino first, and the rappee next; fold and hang up to dry, and they are done.

REMARKS.—The reader will see that the rappee merino followed the claret merino all through the processes they went, from the black to make them claret and rappee, without helping the copper with any drugs for the rappee. There was no necessity for it, the claret merino having left plenty of drugs in the copper. After I had prepared my merinos in the alum and spirits, I could have dyed them with peachwood, but I have dyed them the cheapest, best, and simplest way—although cudbear, with which I have dyed them, is eighteenpence a pound, and peachwood threepence a pound. But the difference is, that one pound nor two pounds of peachwood will go as far as one pound of cudbear; besides, the cudbear nourishes the wool and makes it soft, and a beautiful transparent color.

*To Dye fifty yards of Green Worsted Thread and White Cotton Thread Damask and one Table Cover of the same Material, Amber.*

Clean these materials in very hot soap liquors, as hot as the hand will bear, with some soda in each. They will take three or four liquors. You must give them a good deal of time, so that every bit of the blue may be off before you attempt to dye them. When all the blue is off they will be a buffish yellow, and when they come to that color in the cleaning, get them up and give them a clean thin soap liquor nice and hot, and plenty of time in it, say twenty minutes; then fold them up, and put them to drain on the pegs.

Put into the large copper, when it is scalding hot, two pounds of turmeric and half a pound of tartaric acid. Have two clean sticks on the side of the copper ready for use, and open out the work and handle it well in the



copper for half an hour, not leaving it for a moment during that time. You must mind not to rinse it out of the soap, and you must see that the soap is fat in it before you put it in the turmeric and acid copper. Let there be no mistake about this, and if the copper is more than scalding hot the work will be spoiled. When the half hour is up take all the fire from under the copper, shut the door, and leave the work in the copper while you make up two clean cold rinsing waters. This done throw them up on a clean puncher over the copper, and give them a small half teacupful of vitriol in the liquor they have just been taken out of. Stir the liquor up well with your stick, and put the work in the copper again, and handle it well for ten minutes. Get them up and rinse them in these three cold waters, fold them up, put them to drain, and hang them up in a warm room to dry. When dry take them down, shake them well, and send them to the pressers, who finish them.

REMARK.—This is the best way of doing this work, as well as the cheapest.

#### *Another Method.*

Clean as above; be sure to take all the blue off in hot, clean soap liquors, and have a tub of clean cold water, and put half a pint of oil of vitriol in it—stir it well, and take your work out of the last soap liquor and handle well in this spirit water, then take it up and give it two clean cold waters—put it on the pegs to drain, and put seven pounds of quercitron bark into a small copper and boil it well for half an hour, and have the large copper boiling hot ready for bark to be turned over into it through a sieve. Put a quart of bark spirit into the copper, and open out the work; put into the copper, handle it with a stick, and boil it well for forty minutes, when it is done. Draw the copper fire, take the work out of the copper, rinse it, dry it, and it is done, when callendered or pressed.

*Another Method of Dyeing the above Amber.*

When this work is cleaned, spirited, and rinsed in clean cold waters out of the spirits, and put on a peg to drain; put into your large copper three pounds of ground alum, and one quart of muriate of tin, and boil your work in it for forty minutes, and then take them up, and hang them to cool, and when cold, rinse, and put them on the pegs to drain. Now to dye them, and that is another question. Which way shall I proceed now that they are ready to suck up any amount of dye-stuff? Shall it be with young or old fustic, French berries, weld, or quercitron bark? Well, let us take old fustic for choice, and put in for the above green damask (after discharging the blue out of it, and preparing it to take the pure dye-stuff), in clean boiling water, only seven pounds of the best old fustic chips, and boil it in this for forty minutes, and rinse it and get it up in the usual way of rinsing, drying, and finishing.

REMARKS.—The young fustic does not dye prepared ambers or green so well as old fustic; the bark does very well, but it takes a great deal of rinsing, or the work will be blind. Turmeric, after all is said and done, is the cheapest and best, for it is only to take out of the soap, and put it in the turmeric copper, and give it forty minutes in it, without boiling, and it is ready to take up out of the copper, ready dyed, and a much brighter color than the others that were so much trouble and expense in preparing to take the dye-stuff.

*To Dye Green Woollen and Cotton Damask Table Covers, fifty yards of Bed and Window Furniture, Fawn or Vaunterine.*

To dye these goods fawn color, the blue must be cleaned off first. You will then put in the large copper one pound of sumach, four ounces of cudbear, and a half teacupful of scalded Saxon blue, and one pound of tartaric acid. Put your damask and table cover into this

copper directly, out of the soap liquor, as you did the other lots of amber, and boil it well for one hour, and it is dyed a very nice fawn color. This way is the easiest and best.

In this copper, without throwing away the liquor, you will dye the damask furniture and table cover, vaunterine.

Put in the copper half a pail of ground ebony, two pounds of turmeric, and one pound of tartaric acid; boil these for five minutes, and open out the work, and put it in the copper, and boil it well for half an hour. Now get it up out of the copper, and put it in eight ounces of cudbear. Put your work back in the copper, and boil it well in it, and get it up to cool; rinse it in three clean cold waters, fold it up, and hang up in a cold or hot room to dry, and when dry, shake it well, and finish it, and it is done when it is well hot pressed or friction-callendered.

REMARKS.—The reason of putting a green worsted and cotton table cover with this green damask, in all these four colors, is to let the dyer see that he can dye a little thing like this table cover in with a job like the damask, and can be done with the damask at little or no expense to him. These cotton and woollen damasks must have a water starch after the rinsing, they are very soft without it, it puts a gloss and makes a clean finish on them.

*To Dye Two Ladies' French Merino Dresses that are now Green, Brown, Olive, and French Brown.*

Put in a copper that will hold four or five pails, half a pailful of walnut rinds, and boil your merino in this directly it comes out of the soap as directed above, for one hour, and it is dyed olive. Add to this copper two pounds of redwood, and boil well for one hour, handling well all the time; now get it up to cool, and rinse both well, and hang it up to dry. These colors are so fast, that soap, soda, or spirits will darken them; the more you try to discharge these colors, the further you are off accomplishing it. This work must be very well



rinsed with four or five clean cold waters, and in the last but one they must have about half a teacupful of oil of vitriol, and handle well in it.

*To make the best Grain Spirits for Cochineal, to Dye  
Moreens, Damasks, and Ladies' Merinos, Scarlet.*

Put twelve pounds of muriatic acid, and four pounds of aquafortis in a stone jar, and to every pound of spirit, put two ounces of grain tin in the jar; the tin must be in particles, and put in about four ounces at a time, until you get all the tin in the spirits; for once you begin to put the tin in, you must continue feeding it, and not leave off until you have given it all the tin you intend; you must not leave off while the spirit is working, but keep it on the work until you have done. Most dyers consider the more tin spirits get, the more attraction there will be to the wool, and that it takes a stronger and a better color. Half-grain and half-lac will dye a good crimson on wool with the above spirits. When the spirit is sufficiently killed, put it by in a dry place, with a stopper on the jar, until you want to use it. You can make from one pound to one hundred pounds by this calculation, that is, three of spirits of salts to one of aquafortis, and eight ounces of tin for four pounds of grain spirits.

*Directions to make Spirits of Salts to Dye Puce and Dark  
Blue, in Ladies' Merinos, and other Woollen Goods.*

Put twelve pounds of muriatic acid in a jar, and melt your tin (see page 91), and to every pound of spirits, put in the jar two ounces of grain tin, and one ounce of oil of vitriol. You must put in the tin in the spirits by the ounce, as near as you can guess it. You begin thus: one ounce of tin in your spirits, then one ounce of oil of vitriol directly after it; you must keep away from the jar while you are putting in the vitriol. When this first lot is nearly worked down, begin again, and so you will go



on for twelve times, and in a day or two it will be fit for use.

*To Dye Ladies' Merino Dresses and other Woollen Goods  
Puce, Violet, and Dark Blue.*

The ladies' merino dresses and other woollen goods, intended for this color, must be white, pale blue, or puce; no other colors will dye this color well. Dark blue will not. Indigo vat and orchil is the best for puces and violets. But I am now going to dye these colors with muriate of tin and logwood, at a tithe of the expense, and it is only dyers that can tell one from the other. To make this plan, let some of my readers, that have a blue merino, and would like it a puce color, practise on the dress. Clean the dress in good strong soap liquors, with a little soda in each liquor, and spirit it directly out of the soap; give it one clean water. Clean out a small copper, that will hold four or five pails of water, get it on to a boil, have a clean stick on the side of the copper, ready for use. Put into the copper one pint of muriate of tin, and boil the merino in this forty minutes, handling it well all the time, now take it up, and cool it on the tenter-hooks (see page 26); leave it to cool while you throw away the liquor, fill the copper with clean water, and get it on to a boil. Now rinse the merino dress, and put it to drain, and have a pound of logwood boiled up in four quarts of water by you, and strain all the liquor through a sieve into the copper of clean boiling water, and after it put in a tablespoonful of oil of vitriol, stir it well, and put the merino dress in; boil it well for forty minutes, and it is dyed a very pretty puce, ready for rinsing, drying, and finishing.

*To Dye a Lady's Merino Dress Violet and another Dark  
Blue with Muriate of Tin.*

These dresses having been previously cleaned and prepared, we proceed as follows:—

Fill a little copper with clean water, make it boil, and

put in it half a pound of tartaric acid, half a pint of scalded Saxon blue, and one pint of muriate of tin. Put your merino in this, boil it well for forty minutes, and get it up to cool. While it is cooling, put in the copper the merino for dark blue, with half a pint more of scalded Saxon blue, and half a pint more of the muriate of tin. Put the merino for dark blue into the copper, and boil it well for twenty minutes. Get it up and cool it, and put in the copper a quarter of a pound of copperas; stir it well, and return the dark blue merino to the copper; boil it for twenty minutes longer, and get it up to cool. Throw away the contents of the copper, scour it out, fill it with clean water, and get it on to a boil directly; and while it is doing so rinse the two merinos—the violet first, the dark blue next—in two clean cold waters. Have two pounds of logwood boiled up in a gallon of water, and strain two quarts of it into the copper, and one tablespoonful of oil of vitriol; stir it well, handle the violet merino in the copper, and boil it well for forty minutes; take it out of the copper, and put it out of your way to cool on the tenter-hooks. Strain the remainder of the logwood into the copper, put in the merino for dark blue, and boil it well for forty minutes; then take it out, hang up to cool, and both are dyed in one copper. The dark blue was dyed with what the violet left. There was a difference in the preparation. The dark blue had half a pound of copperas—the violet had none. These two merinos must be rinsed in three clean cold waters, with common sour in each, and sheeted up dry in the shawl sheets. They are a good strong color, but very hard to dry safely, on account of the blue that was necessarily put in them in the preparation.

*To make Scarlet Spirits for Woollen Goods, the Italian Way, for Cochineal, Kermes, and Madder.*

Have a clean stoneware water pitcher, and put in it eight pounds of aquafortis, twelve pounds of water, two pounds of sal ammoniac well pounded, and forty ounces

of grain tin in particles. Put in ten ounces of the tin first, and stir it well with a glass rod; and so go on gently until all the tin is in the spirits. You must not leave it until all the tin is in the spirits. The pitcher must be lightly covered over with a piece of thin flannel, to keep as much of the gas in it as possible, and to keep the heat in to assist the spirits to eat up the tin. It must not be in a cold place while it is working; and when it has done working, it must be put into a stone jar, or carboy, with a stopper to prevent the sal ammoniac escaping. I have given a receipt for making scarlet spirits in quite a different way from this. One is equally as good as the other. Every dyer has his fancy for making grain spirits. Some use saltpetre, others bay salt; some dyers will cram the spirits with tin, and others do not give it enough. But the medium is the best.

REMARKS.—There is no saving in dyers making their own spirits, especially in England, where there are large manufactories all over the country. If my reader will look over the drysalter's list of prices, he will see it is not worth losing his time. But in the Colonies and America these spirit receipts will be valuable, as almost everywhere abroad there are to be obtained oil of vitriol, spirits of salts, aquafortis, and grain tin in the stores. My instructions, if followed to the letter, will teach any person to make dyers' spirits.

*To make Ammonia and Cochineal Paste, to work in the Grain Copper Crimson Woollens.*

Take one pound of the best ground cochineal and one quart of liquid ammonia, and mix them in their pure state in an earthen pickle jar. Put the cochineal in the jar first, and after it the ammonia. Stir them well until they become as thick as oil. The jar, with the ammonia and cochineal in it, is to be put in a pot of water (in the same way as carpenters boil their glue), boiled well for two hours, and never left but stirred all the time. When the two hours are expired they will be amalga-



mated. The pot is now to be taken off the fire, and the jar put on a board shelf to cool, the ingredients being well stirred occasionally while cooling. The jar is to be well covered while cooling, to prevent the ammonia escaping; and when it is cold, cork up the jar, put it on a shelf, and the paste is fit for use.

*To Dye fifty yards of Damask, fifty yards of Moreen Furniture, and five French Merinos with the above Paste, a Crimson, with Cochineal and Spirits.*

Get the copper with clean water to a boil, and put in it half a pound of tartar, two pounds of cochineal, two pints of grain spirits, and half a pint of cochineal paste, prepared as above. Dye the five merino dresses. Open them out, and while you take one dress, let your man take another, and handle them well in the copper; then take the other three in the copper, and handle them well for an hour. Take them up and cool them, and give them to your man to rinse in four separate clean waters. Dye the fifty yards of moreen next. Put in the copper for this lot three-quarters of a pound of cochineal, one pint of grain spirits, and a quarter of a pound of the cochineal paste. Open out the moreens, put them in the copper, and boil them well for one hour. Fill up the copper with clean water. Take out the moreens, put them on the tenter-hooks to cool, and tell your man to rinse them in three clean waters. Now go on with the fifty yards of damask for crimson. Put in the copper for this lot three-quarters of a pound of cochineal, and one pint of grain spirits. You are not to give them any paste or tartar. Open out the work, handle it well in the copper, and boil it well for an hour; then fill up the copper with clean water, and take out the work to cool, and rinse. Hang up all the work in a hot room to dry; and when dry, it is ready for finishing. The merinos must be damped and brushed before they are sent to be finished, and the moreens and damasks picked—they never look nice without this is done.



REMARKS.—These crimsons are the brightest and best, as well as the quickest we dye. Very few, if any dyers in London know anything of the paste as yet. All this work must be cleaned and dyed before you begin to dye it; that is best, it takes less dye-stuff.

*To Dye fifty yards of Damask Crimson another way.*

Clean, spirit, and rinse this work, put on a peg to drain, and clean out the large copper, and make it boil. Put in it one pound of tartar, one pound of cochineal, and a quarter of a pound of cudbear; boil them well for five minutes, and then put in the copper a pint and a half of grain spirits. Always put the work in the copper directly after the spirits, boil it well for one hour, and it is dyed. Get it up to cool on the hooks, and tell your man to rinse it well in three separate clean cold waters and hang it up.

REMARKS.—I put cudbear in this copper to blue my crimson instead of cochineal paste; there is a great difference in the two colors. It is quite a common way to dye crimson, but I do not like it. I prefer putting the cudbear in after the cochineal is on the work, for the cudbear takes a hold of the work, and will not let the grain go on as it should.

*To Dye forty yards of Damask Crimson another way.*

Clean out your copper, and when boiling, put in half a pound of tartar, three-quarters of a pound of ground cochineal, and one pint of grain spirits; open out the work, and put it in the copper, and make it boil well for one hour; take it up, and rinse it in three clean waters, and put it on the horse to drain. Empty the copper, and fill it up with clean water; make it boil directly, and put in it a quarter of a pound of cudbear; make the cudbear boil for five minutes, well stirring it all the time. Open the copper door, and put the work in the copper, and handle it well with a stick all the time, for

half an hour ; the copper must not boil hard during that time. Now fill up the copper with clean cold water, and get your work up out of it on the hooks to cool, and tell your man to rinse and hang up to dry ; and when dry it is ready for dressing.

REMARKS.—This is a very good way to dye crimson, but there are two coppers wanted, and that makes it come expensive. To remedy that I have worked the cudbear and cochineal together, but the spirits and the tartar, as well as the boiling, injure the cudbear, and to have the cudbear in its purity, I have given it a copper by itself ; but that is an expensive way of doing it, for four ounces of cochineal paste, worked in the copper with the cochineal and spirits, would have made it a splendid crimson.

*To Dye twenty yards of Green Moreen, ten yards of Green Damask, ten yards of Green Worsted and Cotton Damask, and one Green Worsted and Cotton Table Cover in one Copper, Crimson.*

Take all this work into the dye-house, and clean it in good hot soap and soda liquors, give them time and every bit of blue will come off, and leave them a cane color (some of my customers like this cane color, and if my instructions are such, I dry them out of a thin liquor, and have them pressed and sent home ; and very well they look too). I now give them a good hot thin soap liquor and fold them up, and make up a cold water and strong spirit for them ; put them in it, and handle them well for ten minutes ; then get up, and give two clean waters, fold up and put them on the pegs to drain, and they are ready for dyeing.

Put into your large copper, one pound of crude tartar, one pound of cochineal, half a pound of cochineal paste, and a pint and a half of grain spirits. Stir these well with your stick, and call your man to give you a hand with the work—you give him the moreens, and you take the damasks. Now put all in, one after the other, and

handle them well for an hour; when the time is up, fill up the copper with clean water, and take them out of the copper, cool, rinse, and hang up, and when dry take down, well shake, and send them to be finished.

REMARKS.—When I mention any particular time, I mean it, and I hope that any person following my instructions to dye a copper of work, will particularly attend to the weight, measurement, and time I here lay down; if they do not do that, it is their way of dyeing the work, not mine.

*To Clean and Re-dye four Crimson Broad Cloth Curtains.*

These four crimson curtains were very fine broad cloth, and a grain crimson, four yards long and one and three-quarters wide, seven yards in each curtain, in all twenty-eight yards. I had cut down and melted five pounds of the best mottled soap in five pails of scalding water and two pounds of pearlash; I made up three separate hot clean soap liquors, of six pails each, in three separate tubs, and divided the soap and the ash equally in three tubs, leaving enough soap for a thin soap liquor as a finishing. I now began cleaning, and took one curtain at a time, and worked and gently punched it through one soap liquor, wrung it out of this, put it in the same manner through the next two, and in another tub gave it a warm thin soap liquor; out of this I gave it a teacupful of oil of vitriol, well mixed in twenty pails of cold water in a clean vessel, handled it well in this for ten minutes, took it up, put it to drain, and gave it a clean cold water; handled it well in this, folded it up smooth, drained it, and dried it in a hot room, and this one curtain was done as far as cleaning went. I cleaned the other three curtains in exactly the same manner and would not alter it if there was fifty.

When these four curtains were dry I had a copper that would hold twenty pails of water, well cleaned and got on to a boil, and put into it one pound of crude tartar, then one pound of ground cochineal (that is allowing a



quarter of a pound for each curtain), and one pint of grain spirits, I put in the four curtains at once, with help, into the copper and boiled them well for two hours, well handling them all the time, then got them up, cooled them, rinsed them in four clean waters, dried them, and when dry brushed them well, sent them to the hot pressers to finish, and they are, when pressed, ready to re-make and re-hang in their former place, and very few people would ever think they were dyed.

REMARKS.—These four broad cloth curtains could be cleaned and dyed at once, but they would take a pound and a half of cochineal and would not be so good a color. I give time, weight, and measure in describing how these four curtains were done, and one or a hundred could be done on the same principle. If these four curtains were a good color and fit to go as cleaned only, I would clean them one by one in blood warm liquor spirit, out of thin soap-liquor, rinse in clean cold water and dry directly in a warm room, then well brush and have them hot pressed for a finish, and they are done.

*Directions to Clean and Re-dye four Green Broad Cloth Window Curtains.*

These four green cloth curtains were exactly the same in material and measurement as the above crimson ones. Clean and spirit them exactly in the same manner as the crimson cloth curtains, but do not dry them, then put them on the pegs to drain, and have a copper, containing twenty pails of boiling water, and put one pail of fustic chips into it, boil it well for ten minutes. Open the copper door and throw a handful of alum in it, scald up half a pint of Saxon blue in two quarts of water, put it to settle, and then put half of it in the copper and a pound of tartar. Get all the cloth in the copper at once, and boil it well in this for forty minutes, get it up and put in nearly all the blue that is left in the jar, and half a teacupful of oil of vitriol, and boil it well in this for forty minutes. Now fill the copper with clean cold



water, damp the fire, take up the cloth to cool, and rinse in four clean cold waters, hang up to dry, and then well shake, brush, and grain down the face. Have it hot pressed and it is ready to make up again.

*Kermes, a Worm used for Dyeing Scarlet on Wool, before Cochineal was brought from America.*

The kermes is a kind of violet or brilliant brown gall, proceeding from the female insect, which fixes itself, and dies upon the leaves of the green oak of Provence, or of Italy. This female insect in dying and attaching itself assumes the form of a cap; this insect is collected in the nights of May and June. Kermes have all the properties of the animal matters—its coloring matter, which forms its principal character, is soluble in water, and leaves a highly colored liquor. When kermes are used in dyeing, alum and tartar must be the mordant; the color it produces on wool has less lustre than cochineal, but it has more solidity, and we may remove spots of grease without altering the dye of the cloth. The blood red of the ancient tapestry proceeds from it. On account of the unalterability of this color, it is to be regretted that it is not more in use than it is.—‘Fourcroy’s Chemistry,’ vol. x. page 501.

There was extracted from coccus, now known under the name of kermes, a dye which was hardly less esteemed than purple, and which was sometimes associated with it. As we already mentioned, Pliny relates that it was employed for the robes of emperors; the name of scarlet was usually given to it, but it was sometimes confounded with purple. Now we understand the management of the kermes, in probably a more advantageous manner than the ancients did, because we possess a pure alum, which disposes the stuff to receive a finer and more permanent color, and yet our dyers have been obliged to renounce its use almost entirely, notwithstanding the solidity of its color, because it cannot bear a comparison

with the colors now produced from cochineal.—From ‘Dr. Ure’s Elements of the Art of Dyeing,’ vol. i. pages 14 and 18.

*To Dye fifty yards of Drab Worsted Damask Scarlet, with Kermes, also ten yards of Worsted Fringe.*

Clean your work well in clean soap liquors, with a little soda or ash in each liquor; fold up out of a thin, hot, soap liquor; spirit, and rinse out of spirit, fold up your work and put it to drain on the pegs. Put in the large copper, four pounds of the best ground alum, and one pound of crude tartar; open out your work, put it in the copper, and boil it well for one hour; when the time is up, fill up the copper with clean water, open the copper door, take it out of the copper, and cool it well by hanging it on the tenter-hooks. While you empty the copper, and fill it with clean water, and when it is coming on to a boil, take down your work and rinse it in one clean water; fold it up, and put it on the pegs, and it is ready for dyeing. Put in the copper five pounds of ground kermes, and boil it well for ten minutes, keep stirring the copper well all the time. Now open out the work ready for the copper, and put in the copper with the kermes, one pint of scarlet spirits (see page 161); now put in the work directly, and boil well for an hour, and when the time is up, fill up the copper with clean water, and take the work out, hang it up to cool, and rinse it in three clean waters, and put it on the pegs to drain, and hang up in a hot stove room to dry, and when dried, it is ready for finishing.

REMARKS.—Five pounds of kermes appears a large lot of dye-stuff to give this work, you will say—it will never pay—but it will not do with less; a pound of kermes for a pound of woollen goods is the complement, and in the mordant it is a pound of alum for every five pounds of wool, and half a pound of tartar. The mordant must be in a separate copper, not with the kermes.

*To Dye forty yards of Amber Moreen and three Buff, White, or Amber, Color French Merino Ladies' Dresses Scarlet.*

Have these articles well cleaned in strong soap, rinsed, and spirited, and put on a peg to drain out of the way. Have the large copper well scoured out, and put in it one pound of crude tartar, half a pound of the best ground cochineal, and a quart of the solution of tin. Put the two French merinos in this, boil them well for forty minutes, get them up and hang them to cool out of your way in the dye-house. Handle in the moreen, and boil it well in this copper for half an hour, well handling it all the time. The half hour being expired, take it up and hang it on the hooks to cool. Throw away the liquor in the copper, scour it out, fill it with clean water, and get it on to a boil directly. While the copper is boiling rinse your scarlets, taking the merinos first, fold up out of the waters, put them on the pegs to drain, and begin to give them another copper as they are only half dyed. You can see by the quantity of cochineal I gave them at first that it was not enough for the work, and I gave them more spirits than if I intended them to be done in one copper. This first copper cleans them from the old color, and the soap and second copper finish them clean and clear.

The second copper being ready, throw in a quart of bran, make it boil for five minutes, and skim it; open the copper door, and put in half a pound of tartar, one pound of best ground cochineal, and one pint of grain spirits. Put in the three merinos first, handle them well for forty minutes, and they are done. Now put in the copper, for the moreen, one pound of cochineal, and one pint of grain spirits; boil them well in this forty minutes, and they are done, ready for rinsing. They must be rinsed well in three clean waters, folded, drained, and hung up to dry in a warm room.

REMARKS.—This is rather an expensive way of dyeing this work scarlet. However, scarlet is an expensive



color. This way of dyeing it is certain, and not much more expense than the other. It is the time it requires that makes it expensive.

*Lac, a Worm used for dyeing Scarlets in Wool, a Substitute for Cochineal.*

“What is improperly called gum lac in commerce is a resin of a reddish-brown color, semi-transparent, dry, and brittle, deposited on branches round which it forms a hive or heap of cells, which contain the eggs of a species of insect. It was formerly believed to proceed from a species of ant; it is now known that it is a coccus, whose puncture produces on the young shoot of the *ficus Indica* a resinous exudation. They distinguish the lac in grains, in sticks, in lumps, and in plates, or shell lac. The two first are in its natural state; the last is the resin melted and poured into plates. There exists in this lac a coloring matter, which appears to proceed from the insect, to the action of which its discharge is owing, and the young of which are found inclosed in the cells. It was on account of this coloration, and of the cells destined to lodge the young, of which this concretion is formed, that Geoffrey compared this resin to wax. It is asserted that this resin is employed in India for dyeing cloth red, and in the Levant for dyeing the leather called Morocco leather. Its great use is in the preparation of sealing wax, of which it forms the base. It enters into the composition of thick varnishes of China and Japan, on which account they are called lacque. It is from the denomination of this resin that the preparation of animal and vegetable colors destined for painting have been called lakes. Lac will yield its color by boiling in clean water.”—From ‘Fourcroy’s Chemistry,’ vol. x. page 447.

REMARKS.—It is a singular fact that these four worms—the silkworm, the resin-lac worm, the kermes worm, and the cochineal—have from the beginning of the



world found such immense employment for mankind. A merciful and foreseeing Providence called them into existence to afford employment to man. In the countries where they grow they are a blessing to the poor; for although they do not sow, yet they reap. Perhaps Providence had a meaning in that also, although we are told that those who do not sow ought not to reap.

*To Dye forty yards of Blue Damasks, and forty yards of Light Drab Moreen Bed and Window Curtains Scarlet, with Lac, instead of Cochineul.*

Having all my damask and moreen well cleaned in soap, and all the blue off the blue damask, I have the large copper scoured out, filled with clean water, and got on to a boil directly. I now get a clean pickle jar that will hold four quarts, and put into it three pounds of ground lac dye, or dyer's lac, and three pints of lac spirits, and stir them well with a strong pipe stopper. I then put the jar to swim in the boiling copper, and keep stirring until the vapor prevents me seeing what is in the bottom of the jar, which ought to be in about ten minutes. Taking the jar out of the copper I fill it up with clean water, stirring it well all the time. Now I have four quarts of lac in my jar ready for use, and the copper ready boiling; and I begin to dye one lot, taking the drab moreen first. Having a clean stick, I put one pound of crude tartar in the copper, and stir it well until it is melted; and then I put in five pints of the prepared lac for the moreens, leaving only three pints to dye the damask. I now open out the moreens and put them into the copper, and boil them well for one hour, handling them all the time. When the hour is up, I fill the copper with clean water, and take the moreens out, hang them to cool, tell my man to rinse them, and they are done. I now put the three pints of prepared lac into the copper, stirring it well, and then put in the damask for scarlet, and boil it well for one

hour; fill up my copper, take out the moreen, hang it on the tenters to cool, tell my man to rinse and hang it up to dry, and it is ready for finishing.

*Another Method to Dye the above with Lac.*

Have the large copper well scoured, filled up with clean water, and made to boil. Now put in the copper two pounds of ground Roman alum, and one pound of tartar; take the moreens as you did before, and boil them in this liquor one hour, well stirring in the copper all the time. When the time is up, fill up the copper with clean cold water, and get them up on the tenter-hooks to cool; take the damask lot next, in the copper, and put one pound of ground alum in it first, stir it well, and put the work in, boil it well for an hour, and get up on the tenter-hooks to cool. Give these jobs to your man to rinse, while you throw away the liquor out of the copper; scour it out, and fill it up with clean cold water; get it on to a boil, put the tartar in the copper, and the lac after it in the same proportions and time as you did the other lot without this preparation, and they are done.

*To Dye the above two similar lots of Woollens Crimson, with Lac, in two coppers.*

The day before you dye these two woollen jobs with lac, put the same quantity of lac and spirit together in the jar used for the first lot, and stir it well for twenty minutes; now take it into the kitchen, put it on the hob, but away from the fire. I only want a gentle heat, and to let the gas escape up the chimney; there is no danger in placing it on the hob. This must be covered over to keep the soot out, a piece of thick brown paper is best to put on it, and it must be well stirred every three or four hours, until you want it; you will dye these two lots next day, scarlet, exactly as you dyed the first two lots, and when they are well rinsed, put half a pint of

cudbear in a clean copper of boiling water; open the copper door, and handle them in this liquor for forty minutes, take them up, and they are done. Do exactly the same with the next lot, and they are dyed a good strong crimson, that will clean and not soon fade.

*To Dye one Pink and one Pale Blue French Merino Ladies' Dresses, and two Blue Damask Table Covers Scarlet and Crimson, with Lac Dye.*

These dresses must be first well cleaned in soap, and all the old colors cleaned off, rinsed, and put on the horse to drain. Put two pounds of lac dye in a jar, and three pints of lac spirits, two or three days to digest before you want it; you need not put this on the hob, nor in the copper, for this is a third way, and the best; it must be in a dry place, covered over not too close, and well stirred occasionally. We will begin and dye the scarlets, of course, first, by cleaning out a small copper that will hold four or five pails, and fill it up with clean water, get it on to a boil, and put a quarter of a pound of tartar in it, and open the copper door; now fill up your lac jar with boiling water, well stirring it all the time you are putting the water in; now you have four quarts of prepared lac dye; put two quarts of it in the copper, then take the French merino that was pink, and handle it well in the copper for forty minutes; put cold water in the copper, and take the merino up, rinse in three waters, and it is done. Put in a pint of the lac for the table cover for scarlet, and boil the cover for twenty minutes; rinse in three waters, and it is done. Dye the pale blue merino crimson; give it three pints of lac, out of the four pints that are left; give it forty minutes good boiling, get it up, and rinse in three waters; give the table cover the last pint of lac, and twenty minutes' boiling, and take it up. Throw away the contents of your copper, scour it out, and fill it up with clean water, make it boil, and put in half a pint of cudbear; make this boil for five minutes, well stirring



all the time; now put in your merino, and give it half an hour in this copper; rinse in three waters, and let the table cover follow, with a quarter of a pint of cudbear; give it twenty minutes in this copper, and take it up; now rinse all again, the scarlets first, and hang them up to dry.

*To Dye a similar lot of work, the same colors with Cochineal, for a comparison of the time and expense of both Colors.*

The work is all clean and ready on the peg to dye. Clean a copper that will hold four or five pails of water, fill it up with clean water, throw a handful of bran in, and let it boil for five minutes, skim it, and open the copper door; now put in a quarter of a pound of tartar, and three-quarters of a pound of the best ground cochineal, and half a pint of grain spirits. Put in the pink French merino for scarlet; boil it for forty minutes; fill up the copper with clean water, take it out of the copper, hang it on the hooks to cool, and it is done. The table cover is next put in with four ounces of cochineal, and a tea-cupful of green spirits, and boil the cover in this for twenty minutes; get it up to cool on the tenter-hooks, and it is done. Now put in the same copper, for the crimson merino, three-quarters of a pound of cochineal, and a quarter of a pint of cochineal paste, and half a pint of grain spirits; handle the pale French blue merino in the copper for forty minutes, boiling well all the time; when the time is up, fill up the copper with clean water, take the work up out of the copper, put it on the hooks to cool, and it is done. The table cover is next; put in the copper four ounces of cochineal for it, boil it well for twenty minutes, open the copper door and damp the fire, take up the table cover out of the copper, and hang it on the hooks to cool; they are now all dyed, and ready for rinsing; give them three clean cold waters, fold them up, and hang them in a warm room to dry with dispatch.



REMARKS.—Some dyers use young fustic in the copper, others quercitron bark, and others turmeric; I always dye my scarlets first, and compare them with a pattern scarlet, and if they are a shade too blue, I turn it with a bowlful of bark liquor, or a little turmeric; one ounce of turmeric will be enough for one dress; the table covers I never give any turmeric. I am often ordered to dye the cotton amber; I do that in the same copper when the scarlets are done, by putting four ounces of turmeric, and that is sufficient to dye the cotton amber. I never like to dye my scarlets or crimsons with lac; other dyers like it. In the drysalter's list of prices you will see there that lac is the cheapest, but the time it takes makes it dear, besides, one pound of lac will not go so far as eight ounces of cochineal, and when both are dyed and compared, cochineal is much the finest color. I have never seen a lac scarlet so good a color as a scarlet made from cochineal, and I do not think I ever will.

*To Dye twenty yards of Drab Cloth Curtains, and twenty yards of Fawn Drugget Carpet Cover, with Madder, Red, or Marone.*

This work must be well cleaned in soap, spirited out of the soap, well rinsed, and put to drain. Clean out the large copper, make it boil, and put six pounds of alum, one pound of red argol, and three pints of muriate of tin in the copper. Have your man to help you, and handle in the copper the cloth curtains first. Keep them well handled in this preparation for an hour and a half; the copper boiling all the time, and then take them up, and hang them on the hooks to cool: And for the fawn drugget, put in the copper four pounds more of alum, and you and your man handle this for one hour in the copper; it must boil well all the time, and not be left for a minute. When the hour has expired, get it up on the hooks, and proceed with well rinsing both lots, the cloth going first into the water; fold up, and put on the pegs to drain. Clean out the copper you

prepared them in, and fill it with clean water; put into it four pounds of madder; and one pailful of peachwood chips; when it boils, have your man to help you, and handle the cloth well in the copper for one hour; take it out, and hang it to cool on the hooks out of the way. Then put in the copper a pail of peachwood for your drugget; you and your man handle this well for an hour, the copper boiling well all the time; now take it up, and hang it on the hooks to cool; tell your man to throw the contents of the copper away, and fill it with clean water, and you go on rinsing well the chips out of these two lots of woollens. They must be well rinsed in cold water, and hung up to dry in a warm room.

*To Dye sixty yards of Fawn Moreen, Orange; and thirty yards of Light Drab Damask Bed and Window Curtains Amber.*

All furniture that is sent from gentlemen's houses of course is not, from smoke and other causes, in a fit state to be dyed without being well cleaned by the dyer before he begins to dye them. We will suppose these have been well cleaned, and we will begin and dye the sixty yards of moreen, orange; and let it be first all through the operations.

The big copper is already boiling; put in three pounds of alum, a quart of grain spirits, and one pound of tartar; open out the moreens, and put them in the copper; boil them well for an hour, having the man to help you all the time. When the time is up, fill up the copper, and take them out; hang them on the tenter-hooks to cool. Now, without making any additions to the copper, put the woollen damask for amber in, and boil them for an hour, well handling them all the time. The man all this time is rinsing the first lot, and getting them ready to dye. The time has expired for the work in the copper, and it is taken out to cool, and given to the man to rinse. While you throw away the copper and fill it up

with clean water, get it on to a boil, and then dye the orange first.

Put into the copper eight ounces of tartar first, then twelve ounces of cochineal, one pound of madder, two pounds of quercitron bark, and a pint of grain spirits; open out the moreens for orange, and put them in the copper, and boil them well for an hour, having a man to assist, handling them well with a stick all the time. When the time is up, fill the copper with clean water, and take them up; rinse them in three clean cold waters, fold them up nicely, and put them on a peg to drain, dry, and finish.

The next lot in this copper, is thirty yards of woollen damask for amber. For this, put into the copper one pound of quercitron bark; open out the work, and boil it well for half an hour, and see if it gets yellow enough for the pattern. Perhaps it is a little too red; then put in half a pound more of bark, half a pint of grain spirits, and half a pound of tartar. Now put it back into the copper, and give it another half-hour's good boiling; take it up, and give it to the man to rinse and hang up. Throw away the contents of the copper, scour it out, and fill it up with clean water, and make up the fire for

*Another way to Dye the above.*

Put into the copper one pound of cochineal, one pound of tartar, one pound of madder, four pounds of quercitron bark, and put the sixty yards of moreen for orange in this; boil it well for an hour and a half, fill up the copper, and put the work on the tenter-hooks to cool; tell the man to rinse it. Let the thirty yards of worsted damask, for amber, follow in this copper. Now put in four ounces of cochineal, two pounds of bark, and one pint of bark spirits: boil the work well in this for one hour, and get them up, rinse, and hang up to dry.



*To Clean and Re-dye sixty yards of Tammy Amber.*

Have the big copper scalding, and clean the worsted tammy in good hot and strong soap liquor. Now put three pounds of turmeric into the copper, and half a pint of oil of vitriol; handle it well in this for one hour; get it up, give it three rinsing waters, with some more sour in each water; fold it up, and hang it up to dry. This tammy must be glazed on one side—the usual way of finishing it.

*Quercitron Bark, to Dye Yellows and Ambers.*

Quercitron is the bark of a yellow oak of New England, of which Mr. Bancroft has given an account, and proposed to substitute for weld in dyeing yellow. It is much richer in color than that plant, and one part of it may supply the place of ten of weld; it is merely boiled in clean water. Its yellow and amber is fixed on wool with alum and muriate of tin, as mordants. The latter gives it a greater degree of lustre. The calico printers prefer this bark to weld, for its strength and economy. It is a very great acquisition in the art of dyeing many colors.—From 'Fourcroy's Chemistry,' vol. viii. page 101.

*To Dye Yellow according to Bancroft's Instructions.*

To dye fifty yards of light-colored worsted damask, well cleaned, spirited, and rinsed, you put into an open-made canvas bag four pounds of quercitron bark and one quart of bark spirit or sulph.-muriate of tin, or muriate of tin—either will do—and one pound of crude tartar. Clean out the big copper, and when it boils, put in the tartar, give it five minutes' boiling, and stir it well with a stick all the time; put in the bark next, and let it boil well for ten minutes; then the solution of tin; and directly after the tin, put in your work, and boil it well in this copper for one hour; keep handling it well with your clean sticks all the time. Now fill up the copper

with clean water, open the copper door, and take the work out of the copper, and it is done. This will take plenty of rinsing, and will dry in a hot or cold room.

REMARKS.—This is a very strong, bright color, and will clean in soap with the commonest attention. It is not so strong a color as when it is prepared hot, but for yellows, with bark as well as turmeric, it requires no preparation, their acids being all they want.

*To Dye Amber and Yellow with Quercitron, according to Mr. Bancroft's Instructions.*

We dyed fifty yards of worsted damask, according to Mr. Bancroft's directions, yellow: we will now dye fifty yards of moreen yellow, fifty yards of silk and worsted damask amber, and fifty yards of amber worsted and cotton damask, which have been sent in to be cleaned and dipped—just the very thing we wanted, to use up what dye-stuff the other two jobs would leave in the copper. This work having been cleaned well in good soap liquor, spirited and rinsed, put it on three different pegs to drain.

Clean out the copper well, and fill it up with clean water; make it boil as soon as possible, and when it boils, put in one pound of crude tartar; boil this well for five minutes, well stirring it all the time. Now open the copper door, beat your fire well, and then put plenty of damp ashes on it, and put two pailfuls of cold water into the copper. Now put into your copper four pounds of ground Roman alum and one quart of bark spirits. Stir these up well, and open out the silk and worsted damask (have a man to help you), put them into the copper, and handle them in it for an hour. Never leave them. The copper door must be kept open, and your fire damped down all the time. When the time is up, get the work out of the copper to cool, and when cool tell your man to rinse them; fold, and put them on a peg. The moreens are next. Put these into the same copper that the damasks left, without any addition of

drugs, and boil them well for an hour: these must be boiled well. If the silk and worsted damasks were boiled, they would be spoiled: a scald is almost too much for them. But these must be well boiled for an hour; when the hour is up, take them out and hang them on the hooks to cool. Put into the copper the fifty yards of worsted and cotton amber damask, to clean and dip. There is no addition to be made to the preparation in the copper; boil them well in this for forty minutes, get them up to cool, and throw away the copper; scour it well out, and fill it up with clean water. Get it to boil directly, and begin dyeing them. Your man by this time has them all rinsed and on the pegs to drain.

Begin and dye the silk and worsted damask amber first. Put into your bag seven pounds of quercitron bark, boil it well for half an hour, open the copper door and damp the fire, get the bag out to drain; save the bag, as you have not done with it yet. Now have the man to help you, open out the damasks, and handle them well in the copper for one hour, then get them up to cool, and they are done. I am looking at the pattern now, as the work ought to be in my mind's eye: for every color I begin to give instructions about, I pin on a bit of brown paper, and go on writing about the color on the pattern before me, but I can assure my readers I find writing more difficult than the dyeing.

The moreens for yellow are the next. You are to put the bark bag into the copper, and let it stop there, to the last. Now open out your moreens for yellow, put them in the copper, boil them well for an hour, and they are done.

The next is the cotton and woollen damask. Keep the bark bag in the copper yet, put the damask into the copper, and boil it well for half an hour, handling it well all the time. Open the copper door, damp the fire, hang up the work on the tenter-hooks to cool, and it is done.

REMARKS.—These colors all improve by cleaning in soap after they are dyed, but if the commonest attention



is paid to them in the preparation and dyeing there is nothing so easy to be done, and no color less expensive to dye. The silk and worsted damask must be damped, brushed, and framed. Some dyers prefer finishing silk and worsted damask on the rolls, and sending them to the pressers to have them finished—which I think is very proper.

*Weld or Wold to Dye Yellow and Amber.*

The stalks of this ripe plant, when dried and tied in bundles, give, by decotion in water, a yellow color, inclining to brown. When diluted in water it has a green tinge. The acid renders it paler, and the alkalies darker; alum forms in it a yellow precipitate, and the liquor preserves a lemon color. The solution of tin produces in it an abundant precipitate of a light yellow color, which is employed as a yellow dye; but it will not succeed unless alum and tartar are employed as mordant. The use of this coloring substance is called welding. Annotto is mixed with it in order to obtain amber and orange casts.—‘Fourcroy’s Chemistry,’ vol. viii. p. 96.

*To Dye fifty yards of Moreen with Weld.*

The moreen is boiled for an hour with four pounds of weld, one pound of tartar, and a quart of muriate of tin; it is then taken out, cooled, and rinsed. One bundle of weld and two pounds of soda are put into a large copper, and the weld is boiled until it falls dead to the bottom of the copper; it is then taken out of the copper, and the moreens put in, and well handled for an hour and a half, the copper boiling all the time. If it is not as dark as you wish, put the weld back in the copper with the work, cutting off the roots first. When the time is up, take it out of the copper, and hang it to cool. Now give it a couple of clean cold waters, and put it to drain. Now clean it in clean soap liquors, and finish it in a warm thin liquor of soap, and hang it up in

a warm room to dry without rinsing. It must be dried in a hot room.

REMARKS.—This is not so strong a color as the bark, but it is quite as bright as its rival. The bark is getting the better of it, I consider, every day, and will beat it; weld has had its day, and will be superseded by the quercitron bark.

*To Dye five Ladies' French Merino Dresses five different Colors, from Ruby to Dark Brown in one little copper.*

In my instructions for the cleaning of woollens, I have remarked: sort your woollens and put up all to dry except the marones, the clarets, the rubies, and all sorts of brown merino dresses. These woollens have been prepared for dyeing, that is boiled off in muriate of tin, alum and copperas; they are now dry, and ready to dye with any of the many dye-stuffs that crimson and brown can be dyed with. I shall dye them now with cudbear, in preference to orchil or peachwood; although in the state they are at present, being full of preparation, they are ready to suck up any dye-stuff they may get.

Clean out well a small copper, that will hold four or five pails of water, fill it up, and get it on to a boil; have a clean copper bowl, and begin

*The Ruby*, first. Put in your copper bowl two pounds of cudbear, and mix it well with clean water as you would flour; when mixed, put it in the copper, and take your ruby merino dress, dry as it is, and handle it well in the copper, boiling it all the time for forty minutes; now fill up the copper, and take the work out, and put it to drain over one of your clean small vessels to save the liquor that will run from it; when it is taken out of the copper, the tenter-hooks are the best for it to hang by; now tell your man to rinse this ruby dress in three cold waters; and hang it up directly in a warm room to dry and it is fit for finishing.

*Crimson* is next. I sometimes give those a scarlet body first; when I do so I only give a dress two ounces

of cudbear in a small copper of clean water; I have not done so in this case, so we must go on. Now mix in the copper bowl as before, one pound of cudbear, and put in the copper, stir it well, and handle the crimson merino dress in the copper for forty minutes, the copper boiling well all the time. Now fill the copper, and take it out to drain as before, and give it to your man to rinse; tell him to give it five minutes in a common sour, and a cold water after the sour; hang it up to dry, and see that he does not touch the ruby with it and it is done.

*Marone* is the next merino I will dye in this copper. Put one pound of cudbear in the copper for this dress, stir it well and handle it in; make it boil well, and give it twenty minutes, and then get up; put in the copper half a pound of turmeric, and the merino back again for twenty minute longer, well handling and boiling it all the time; now fill up the copper with clean water, take up the work to cool, and give it to your man to rinse and hang up to dry carefully, and when dry it is ready for dressing.

*Claret* is next in the same copper. Give this another pound of cudbear, and half an hour's good boiling; take it up, and fill one of your large kettles with scalding water; melt half a pound of copperas in it, handle it well in this for a quarter of an hour; take it up, cool, and rinse it in three waters, and put it in the copper again, and boil it well for half a hour; get it up to drain, and tell your man to rinse it well, and hang it up to dry, and when dry it is ready for dressing.

*Brown* and *Rappee* are next in your copper. For these two merinos, put one pound of cudbear, one pound of turmeric, and one pound of sumach in the copper, and handle in these two merinos, and boil them well for half an hour; fill up the copper, and hang them up to drain over a kettle, and melt a half a pound of copperas in the kettle you had for the claret, and handle them in this for a quarter of an hour, and get them up and rinse them in three waters, and put them back in the copper, and boil them for half an hour; get them up to



drain, give the man the brown to rinse and hang up, and return the rappee merino in the saddening for a quarter of an hour; again take it up, rinse, and return it in the copper; boil it well for half an hour, take it up, cool it, rinse it, hang it up to dry in a warm room, and when dry it is ready for finishing, and tell your man to empty the copper, and fill it up with clean water, and you have done these five dresses.

These merino dresses have been previously prepared in a clean copper of water, and well boiled in a mordant or preparation of alum, muriate of tin, and copperas, well rinsed in cold waters and dried. We are now going to dye them in a different way to the above.

*Another Method to Dye the above.*

The merino dress for ruby cannot be dyed this way, it must be dyed with cudbear or archil. This dress for ruby has not been prepared with the others, it does not want it. Clean out a copper that will hold ten pails, and put one pail of peachwood chips in it; make it boil well for a quarter of an hour, and put the merino for marone in it, dry as it is, and boil it well for forty minutes; fill up the copper with clean water, and take the merino and give it to your man to rinse and hang up and it is done. The next is the claret. Put a bowl of your boiled-up logwood liquor in your copper; half a bowl will do if the logwood liquor is strong, and handle in the claret dress for forty minutes; fill up the copper, take up the dress, and give it to your man to rinse, and it is done. The brown and rappee are next in the copper. Put in two bowls of logwood and half a pail of fustic chips, and boil well before you put the merino dresses in. Now get them in and boil them well for an hour, handling them well all the time; now fill up the copper, and take the merinos and cool them, and give the brown to your man to rinse and hang up, and they are done, and put two more bowls of logwood into the copper, and boil the rappee merino in it for

forty minutes ; fill up your copper, draw the copper fire, take up the merino to cool, give it to your man to rinse and hang up, and you have done so far. These merino dresses when dry must be damped, picked, and well brushed before they are finished.

REMARKS.—These four merinos have been boiled off in muriate of tin, alum, and copperas ; I did not put in chrome, and dried out of it, or they would not have run off so easy. There are two more merinos to dye yet—one ruby and one crimson ; I mean to dye them next, for the purpose of drawing a comparison of the expenses of dyeing six merino dresses one way, and of dyeing six merino dresses a different way. Although there are more ways to dye this work, I have taken what I consider the two best.

*To Dye two Merino Dresses, one Crimson and one Ruby.*

Take a small copper that will hold four or five pails of water, clean it well and make it boil, and put into it half a small teacupful of crude tartar. Boil this for five minutes, and put into the copper half a pound of cochineal, and half a pint of grain spirits, and a quarter of a pint of cochineal paste (see page 161.) Put the merino for crimson in this copper, and boil it well for forty minutes, well handling it all the time, and take it up and cool it ; when cool, give it to your man to rinse, and hang up in a warm room, and it is done, and when dry, ready for finishing.

The ruby is next put into your copper. For the ruby, one quarter of a pound of cochineal, a quarter of a pint of grain spirits ; handle this in the copper for forty minutes ; open the copper door, damp the fire, and take up the merino to cool ; give it to your man to rinse, and throw away the copper ; scour it out well, fill it up with clean water, and get it on to a boil directly. Now put in the copper one quart of archil, stir it well, and put the ruby dress in, and very gently simmer it for forty minutes, well handling it all the time ; when the time

is up, open the copper door, damp the fire, and take the ruby merino out of the copper, hang it up to cool, and give it to your man to rinse, and hang up in a warm room to dry.

REMARKS.—These are the last two merinos of the six that I have dyed to show the comparative expense of dyeing six merinos one way, and six merinos another way, and still produce the very same colors. Perhaps some of my young friends may improve on this; it is for old men to give their experience, and it is the duty of young men to improve by practice what their elder brethren have been doing. It often happens that the apprentice is a better workman than his master, and I hope it may continue so to the end of time, for if that progressive improvement in our arts and sciences was to stop, the world would be at a stand still.

#### LOGWOOD.

“Campeachy or logwood grows in abundance in Jamaica, of which it bears the name; this wood differs from Brazil only by the dyes which it affords; its coloring part is of the same nature; it is rendered lighter and yellow by raw acids, darker and violet by the alkalis, and becomes black in the air with iron; is extremely soluble in water; cannot be fixed alone on stuffs, but requires the action of mordants; is rendered soluble by the metallic solutions alum and tartar; it is like Brazil wood, an extractive color, slowly combustible by the contact of air; it is especially employed for violet dyes, and for giving a velvet appearance and lustre to the black and grays; it is used in the dyeing of silk and woollen, to produce a great number of dyes, from the lilac to the dark violet, by means of the solution of tin. Dark colored and considerably solid lakes are prepared with this decoction.”—From ‘Fourcroy’s Chemistry,’ vol. viii. p. 95.



*To Dye Black on Woollen Fabrics with Logwood.*

As it is not common to dye moreens or damasks black, and it is principally confined to French and English merinos in pieces, and made up, and cloaks, coats, trousers and shawls, and other woollens we dyers have, I will use a little copper that will hold four or five pails of water, and dye a lady's French merino dress black. Supposing it to measure eight or ten yards, I would give it the same weight of logwood as wool. No matter what color it is, it can be dyed black. When the dyer is going to dye black woollens he will look in my book and choose which way he will dye them, and say, "If Love allows so much drugs for a merino dress of eight or ten yards, how much drugs will he allow for this lot of woollens I have to dye?" From the beginning of this book I have tried to use as plain language as possible, and to give weight, measurement, and time to every color. I constantly study to make my instructions as plain and simple as possible, that a child might understand me; I do not give a long rigmarole way of telling how this thing acts, and how the other thing acts, of causes and effects, but I go to work with the confidence and experience of nearly forty years.

*To Dye a new piece of Woollen Cloth Black, or Black in Grain.*

New pieces of cloth as they come from the loom are ridiculous-looking articles, and but for the dyer would not be looked at; they are for all the world like white and gray frieze, full of grease from its own nature, and from different causes in the manufacture. When the dyer has them to dye black he scours them well in hot chamberlye and ash, which turns all the grease into soap, and rinses this well out of it and dyes it a dark woad, or vatted blue. After he dyes it in the woad blue vat, he is obliged to clean the lime and other stuffs it gets in the vat out of it, so as to open the pores of the

wool, or it would not take the black dye well. The bluing and cleaning is called bodying it for black in grain, and dyes used for black are logwood, fustic, and copperas, allowing two pounds of logwood, two pounds of fustic, and one pound of copperas, for every ten yards of cloth. This is boiled well in the logwood and fustic for two hours, turning it over the winch all the time ; it is then got up quickly on the winch, one man turning it, and another man opening the cloth with a stick as it comes up on the winch out of the copper. The copperas is melted in a kettle while the cloth is getting up on the winch, so that the cloth will not lie on the winch a minute longer than it can be helped ; the melted copperas is now put into the copper, and the copper well stirred, and the cloth put into the copper, quickly off the winch, and put under the liquor as it comes off, and then turned back again, the man opening it and pushing down all the time ; it must boil in this well for two hours ; it is then taken out of the copper and put on a horse to cool. The horse is placed before two men, and the cloth is thrown across it, each man takes hold of opposite selvages pulling one against the other, and jerking the piece of cloth in their hands, it is thrown to the other end of the horse, making regular folds, and so on until the cloth is cooled, never letting it touch the ground. They take it now to the river, and with two long flat sticks they beat all the dye-stuff out of it, and reconvey in back to the dye-house, fold it on the horse, and give it a clean copper of fustic, allowing two pounds for every ten yards of cloth ; this is to jet, soften, and cleanse it, which it does admirably. Some dyers put archil in with the fustic, but that is only for very fine clothes, as archil is so expensive. Sometimes they have an archil copper left after dyeing the vatted blues, and they throw that in the fustic, for finishing the blacks ; they then boil the cloth in the fustic for two hours, well winching it all the time, and then throw it across the horse and cool it as before, taking it again to the river, rinsing and beating it as before, again taking it back to the dye-house, where

it is folded on the horse, and dried on the tenters (see page 24.)

REMARKS.—This is the process pursued for the superior cloth that will pay for all this trouble and expense. The next way is, after cleaning, to dye the cloth blue and to boil in miravelines, logwood, walnut shells, or roots instead of miravelines or galls for four hours; then take it up and give it copperas; well boil it in this for two hours; take it up on the horse, and take it to the river and well beat it with the sticks, and bring it back to the dye-house, where it is folded on the horse, and given an old fustic copper and boiled well in this; then throw it on the horse to cool, and it is well beat in the stream. Put it on the kreel, take it to the horse, fold it and tenter it, and it is done. These are what are called blue blacks.

*Another way to Dye new Piece Cloth Black, as it comes from the Loom without Vatting.*

Clean this new piece of cloth in hot chamberlye and ash, well rinse it, and put on the horse to drain, and for every pound weight, when it was dry, in the cloth, put three-quarters of a pound of miravelines; boil this well for half an hour before you put the cloth in; have the winch up and ready for use. Now put the cloth in the copper; one man turning the winch, and another man opening the cloth as it goes over it, and pushing it down. Boil it well in this bodying liquor for two hours; put in a copper three ounces of copperas for every pound of wool, and melt it ready to go in the copper. Take up the cloth carefully on the winch, and put the copperas and the cloth back, and boil it well for two hours. When the time is up, put it on the horse to cool, and while it is cooling have the copper emptied, and get on with clean water; the cloth, with passing and repassing on the horse is cool by this time; rinse it well in the running stream, put it on the barrow, and put it on the horse in the dye-house. Put in the copper a quarter of a pound



of logwood chips, and half a quarter of a pound of fustic chips, for every pound of wool as above. Put the cloth in this copper, and boil it well for an hour, and get it up and rinse it in the river, well beating it with the sticks all this time. Now get it out, put it on the barrow, take it into the dye-house, and put it on the horse to drain, and tenter it. This is a very good black, for it will last as long as the cloth.

*To Dye ten yards of French Merino Black.*

Have a small copper that will hold four or five pails of water, get it on to a boil, and weigh the merino, and put the same weight of logwood chips into the copper. Handle the merino into the copper, dirty and dry as it is; and boil it well in this for forty minutes; keep handling it well all the time. Now get it up and cool it, and put in the copper four ounces of copperas, and put the merino back in the copper, well boiling it for forty minutes, and then take it out of the copper, and hang it on the tenters to cool. Throw away the contents of the copper, and fill it with clean water, and rinse the merino in one cold water, then a spirit of common sour, and a cold water after the spirit, and clean it well in soap liquors; spirit and rinse it out of a thin soap liquor, and hang it up to dry, and when it is dry, it is ready for finishing.

REMARKS.—I always cool my woollens out of the copper before I rinse them, they will never get heat wrinkled if that plan is adopted; and merinos cooled before they are rinsed, do not require so much finishing as those that are put straight out of the copper into the cold rinsing water. It is easy to knock up a few tenter-hooks anywhere to cool the work. This is a very simple way of dyeing black woollens, and it is dyed at once; if I had a dozen merinos to dye, I would not give the same weight of logwood for the dozen, as I would for one. I would only give the weight of ten merinos of the logwood to dye the dozen merinos. If you will look back to my

description of a dye-house, you will see that I have there spoken of a cistern (page 19), to put my old soap liquors in, instead of throwing them away; after I have dyed my black woollens, I throw the copper down, and fill it up with old soap; put some ash or soda in it, and heat it up to clean the blacks; when dyed this way they are a strong color.

*Another Method to Dye Black Woollens.*

Take ten yards of merino, and clean it very well; spirit, rinse, and put it to drain; put into the little copper eight ounces of copperas, four ounces of blue stone, and four ounces of argol; boil these for one hour, and take up and cool; rinse in two waters, and put on a peg to drain. Put weight for weight of logwood chips in the copper, with a handful of soda, and boil well for half an hour; damp the fire, and empty the copper into a kettle, chips and liquor. Put a sieve over the copper, and strain the logwood liquor back into the copper, and put melted mottled soap in it enough to make a soap liquor of it; get on the copper, not to a boil, but sufficient to keep it near to a scald; now put in the work, and handle it in the copper for half an hour, and take it up to cool, and put three ounces of turmeric in the copper, and a couple of bowls of logwood liquor, and handle the work in the copper for another half hour; take it up, cool it, and finish it in a good hot thin liquor of mottled soap, and hang it in a stove room to dry quickly.

REMARKS.—This is a very proper copper to dip a black merino dress that is for cleaning and dipping. Put in the copper a couple of bowls of logwood liquor; put it in dry, and give it twenty minutes in it; get it up and clean it; if it is in pieces, take it out of a thin liquor, and dry it quickly; if it is a made-up dress, take it out of common salt and water; well rinse first before it gets the salt. When you are dyeing these blacks, do not let the copper by any means boil; if you do you will rot the work; the soap rots all kinds of woollen goods, if boiled

in it for a moment only. This is a very clean bright way of dyeing black woollens, but it is not a strong color.

*Common Table Salt a Binder of Colors.*

“The word salt was originally confined to common salt; it was, however, afterwards so generalized as to include every body which is sapid, easily melted, soluble in water, and not combustible; at present it denotes a compound in definite proportions of any matter that the resulting substance does not affect the color, but on the contrary binds it; colors such as greens, blues, pinks, scarlets, crimsons, and puce, are colors bound by an acid and must not have common salt, nothing but common sour, that is very weak oil of vitriol diluted with water, so as the spirit of the vitriol will hardly taste in the water.”—From ‘Dr. Paris’s Elements of Chemistry,’ page 424.

“The marine acid is obtained from common culinary salt; common salt is found in large masses of rocks in England and elsewhere; there are also many salt springs in various parts of the world, and the waters of the ocean everywhere. In England, a brine is composed of sea water, with the addition of rock salt; it is evaporated in large shallow iron boilers, and the crystals of salt are taken out of it in baskets. Salt that was made on Sandwich marshes or flats, was made by spontaneous evaporation; flats are what they used to put the salt water in to evaporate, at Ringsend, near Dublin; they make the salt by the addition of rock salt with sea water, taken in at high tide.”—From ‘Nicholson’s First Principles of Chemistry,’ page 176.

In cleaning and dipping the black merino, I said take it out of common salt, well rinsed before it gets the salt. Salt is one of our best color binders, and you will hear of it a great many times before I have done with this book. It is, next to common sour, one of our best friends, for in cleaning the different colors with soap,



we must be very expeditious and cautious ; but there is no fear as long as we have two such esteemed friends at our elbow as common salt and common sour. At the earliest opportunity, I will introduce my readers to my old and respected friend, common sour.

*Chrome, used as a Mordant or Preparation for Woollen and Cotton Dyeing, in old or new Work.*

“Chromic acid is an orange-colored powder, composed of chromium and oxygen ; it has an acrid metallic taste, soluble in water ; the solution is of a pale yellow, it assumes a variety of beautiful colors, when mixed with different saline solutions ; it also forms various salts, called chromates ; chromic acid was discovered by Vauquelin, it is procured from the red lead ore of Siberia, by separating the lead from the ore by nitric acid.”—From ‘Parke’s Chemical Catechism,’ page 245.

*To Dye ten yards of French Merino Chrome Black.*

Dyers have different ways of cleaning their woollens for chrome black, but the best way is to clean them well in soap and water, and boil them well for half an hour in clean water and argol ; take them up, and hang them up to cool ; throw away the contents of the copper : fill it up with clean water, make it boil, and put four ounces of chrome and four ounces of crude tartar in the copper. Now put in the merino, and boil it well for forty minutes, take it up, cool it, throw away the contents of the copper, and fill it up with clean water. Make it boil, and put an equal weight of logwood chips for the merino to be dyed, as before directed into the copper, and a quarter of that weight of fustic chips : make these boil well for ten minutes, and rinse the merino in two clean waters, drain it, and put it in the copper, and boil it well for one hour, handling it well all the time ; when the hour is up, take it up and cool, rinse, and dry it and it is done.

REMARKS.—This is a very good rich black, and has become a great favorite of late years in the trade, and does not soil the hands. Some dyers get on a copper, and fill it with clean water, get it on to a boil, and clean their woollens as they do the new, with chamber-lye, rinse them out of it, and proceed with the dyeing without boiling them off in argol, that is, they make two coppers dye the work, one for preparation in chrome and tartar and a clean copper for logwood and fustic, and well rinsed in three clean cold waters for a finish.

*To Dye Orleans and Cobourgs Black.*

Before dyeing Orleans and Cobourgs black, prepare in strong cold sumach eight or ten hours, lift out and sadden with copperas or acetate of iron; rinse in two waters and boil in chrome for an hour; take up, cool, and rinse in two clean waters; dye with logwood and fustic, rinse and finish out of a clean fustic liquor.

*To Dye Orleans and Cobourgs Brown.*

Prepare in sumach, sadden and rinse in two clean waters, and for twenty yards of Orleans or Cobourgs, boil up two pounds of redwood and seven pounds of fustic; strain off the chips, and dye in the liquor; if not dark enough, sadden in scalding water, rinse, and return in the copper for twenty minutes; get up and rinse in clean cold waters.

*To Dye Orleans and Cobourgs Marone.*

Prepare in cold sumach for twelve hours, get up and sadden, rinse and hot alum; and for twenty yards boil up four pounds of peachwood chips; put in your work and boil well for forty minutes, get up, strain off the chips, and add half a pound of cudbear; return and boil for twenty minutes, get up, rinse in clean cold waters;

the above ought to have a water starch or common size for a finish.

*To Dye fifty pounds of Wool Jet Black.*

Prepare with two pounds and a half of chrome, boil an hour and wash in two waters.

Dye with twenty pounds of logwood and two pounds of fustic ; boil it well in this for one hour ; rinse in one water, then a slight sour moderately warm, then one cold water, and finish out of a warm one, softened with a little urine.

A pound of wool woven into English or French merino measures about three yards ; common moreen or damask about two yards.

A pound of silk woven into plain or figured sarcenet or satin measures about thirteen yards ; that depends on the thickness of them.

*To Dye fifty pounds of Wool a fast Black.*

Prepare with two pounds of chrome, one pound of tartar, and one quart of muriate of tin ; boil one hour and wash in two waters ; dye with twenty-five pounds of logwood and three pounds of fustic, and boil for thirty minutes ; lift and add one pint of vitriol and return for ten minutes, then wash as above and dry. For to dye a fast blue black use the same materials and time as above, leaving out the fustic ; rinse as usual.—From ‘Thompson’s Dyer’s Assistant,’ p. 37.

*To Dye French Blue Woollens.*

Get two pints of spirits of salts and one pint of oil of vitriol ; mix them together, and be careful that they do not fly over. Have a pickle-jar, put in the spirits of salts first, and then the vitriol, very gently. Put in eight ounces of sal-nixon, pounded very fine ; stir it with a pipe-shank, and let it stand all night. Then to



a copper that will hold five pails of clear water put a pint of these spirits, half a pound of prussiate, and a quarter of a pound of sal-nixon, melted with two quarts of boiling water in a stone mug ; let it settle and put in the clear liquor in the copper, and commence dyeing a French merino dress in Prussian blue. Begin cold, and go on gradually until you get it up to a boil, and then boil it well for twenty minutes ; get it up, and cool it, and rinse well in three or four waters, and in the last water, put in a little raw spirits of salts, give it time in it, and get it up to dry. This is one of the colors I always sheet up dry, as it is the safest.

*Another way.*

Seven pounds of raw spirits of salts, three pounds of oil of vitriol, then add one pound of steel filings, three pounds of green copperas, and last, fourteen pounds of muriate of tin ; all is to be put in gently, and when the heat of the first mixture ceases a little, it must be continued by keeping the jar in hot water, until it eats up all the iron ; then take it out, let it settle, bottle it off, and it is fit for use.

To dye Prussian blue with this preparation, you must put in the copper half a pound of crude tartar first, and half a pound of copperas, and one pint of the preparation ; boil it well in this for twenty minutes ; take it up, cool it, and return it, and boil for twenty minutes longer ; get it up, cool it, rinse, and dye it. Throw away the copper, and fill it with clean cold water, and melt a quarter of a pound of prussiate in a stone mug, and when melted put it in the copper, and handle the merino in ; get it on cold, and go on as fast as you like until you make it boil ; then boil it for ten minutes, and take it up, cool it, and rinse it in three clean waters, with a little common sour in each water.

This is a color I always sheet up dry. This preparation does as a mordant for French blue on silks ; use half a pint in three pails of warm water ; handle it for

ten minutes, rinse, and give it a quarter of a pound of prussiate in a clean kettle, and clean hot water; give it ten minutes in this, and return it in the preparation, and so go on from one liquor to the other, until you have it the color you require; then rinse and sheet up dry.

*The Lyons Preparation for Crimson, Puce, Scarlet, Brown, Lavender, and Green, for both Silks and Woollens.*

Mix four pounds of muriatic acid with ten pounds of oil of vitriol; after this mixture gets cold, add ten pounds of aquafortis to it, then kill it with four pounds of grain tin. Put the jar in sand or hot water, to give it a gentle heat while the spirit is working, and when it has done working, add twenty-four pounds of water to it, that is, the same weight of water to the same weight of the three spirits; let it rest for two or three days, and then bottle it off, and it is fit for use. Be sure to keep a stopper on it.

*The Parisian Preparation for the above Colors.*

Fifteen pounds of spirits of salts, fifteen pounds of oil of vitriol, and fifteen pounds of water, all mixed together; then put in the above five pounds of grain tin; put this in hot sand, or to swim in boiling water directly, and the next morning add ten pounds of water to it; let it lie by for a day or two, and it is fit for use. Proportions: five pounds of spirits of salts, fifteen pounds of oil of vitriol, ten pounds of bay salt, five pounds of grain tin, and ten pounds of water; the stopper must be attended to when bottled off; I always use a good strong stone-ware water pitcher, and good strong stone jars to put the spirits in after I have killed it; carboys are as good, but they are easily broken. By these instructions, one pound or one hundred pounds can be made, more or less. Let your spirits be 25° by the French glass.

*The Spitalfields Preparation for the above.*

Ten pounds of aquafortis, five pounds of muriatic acid, one pound of the spirit of nitre, and two pounds of grain tin (see directions to melt the tin in page 93.) Put all these in a stone pitcher, and put them in some warm corner, and they will digest themselves, and be ready for use in a few days. This is the complement of spirits. This spirit is put in the copper with alum and tartar, to make a preparation of woollens, when it is the dyer's intention to dye them crimson or marone with peachwood or Brazil. I like muriate of tin best, it is not so raw.

*Sulphuric Acid—Oil of Vitriol.*

“In the large manufactories for making sulphuric acid, called oil of vitriol works, the sulphur is mixed with an eighth of its weight of dry nitre, and burnt in very large leaden chambers. The design in using the nitre is to give a larger quantity of pure oxygen gas than could be afforded by confined atmospheric air alone. The floor of the chamber is covered with water, that the sulphuric acid gas may be condensed as it is formed. An indefinite quantity of water is poured into the chambers, and when the manufacturer finds it become sufficiently acid, this acid water is drawn off, and concentrated by boiling. It is then removed to glass retorts, where it receives a greater heat to drive off a further portion of the water. It is considered fit for sale when it is boiled down to the specific gravity of 1.845. The more it boils the stronger it gets, and they are obliged to stop at 2.000 or it would get so oily that it would be useless for commerce. If you visit the apartment where the bottles are boiling in sand, the gas that escapes from the mouths of the bottles will turn the color of your clothes; and if it is a low room, and you are a tall man, it is sure to make your black hat brown. Palm-



ing the men would prevent that.”—From ‘Parke’s Chemical Catechism,’ page 222.

*Muriatic Acid, or Spirit of Salts.*

If we pour oil of vitriol upon common sea salt, white fumes will immediately rise, very full of acid. They are muriatic acid gas; from the concentration of it in retorts with mercury, muriatic acid is made. When perfectly pure, it is colorless.

“*Nitric Acid, or Aquafortis*, is made from equal weights of nitre and oil of vitriol, and is distilled in stone-ware vessels. Orange and yellow vapors are the result of the combination of the nitre and oil of vitriol, and an orange colored liquor will be found in the receiver, which is aquafortis, and is easily acted on by tin. Tin is found in the mines in Cornwall. Employed with spirits, it is a powerful attraction for dye-stuffs.”—From ‘Dr. Paris’s Chemistry,’ pages 331 and 441.

*Directions to Clean and Re-dye forty yards of Pale Blue Moreen or Damask, Bed or Window Curtains.*

This work must be cleaned in clean warm soap liquors, without ash or soda in them, and folded up out of the last liquor, the thin soap liquor, and put on the pegs to drain. Put in a thirty-gallon copper of clean scalding hot water half a pint of oil of vitriol, now open out the work and handle it well in the copper for forty minutes; the copper by no means is to boil, for if it does you will have a bad color. When the time is up, get up the work out of the copper to cool, fold, and drain; empty the copper, scour it, and fill it with clean water; make it boil, put in half a pound of alum, skim off what the alum throws up on the surface, open the copper door, and damp the fire in such a manner as to keep the copper scalding hot, but not to boil. Now put in first half a pound of tartaric acid, four ounces of Saxon blue, or half a pound of paste blue, and see that your dyeing

liquor in a saucer is two shades darker than your pattern; if it is, go on dyeing the work, if not, give more blue till it is. Begin the dyeing by first opening out the work, and handle it in the copper with clean sticks for one hour, then get them up, cool and rinse in one cold water, dry, and finish them, and they are done. We are often obliged to get up these out of the copper to give them more blue and return them. Some dyers prefer paste blue to Saxon blue, but the blue drawn off the blanket is preferable to either.

*Directions to Clean and Dye seventy yards of Drab Damask Window Curtains, Emerald Green.*

Melt two bars of soap in eight pails of boiling water, and put in a tub four pails of very hot water, one pound of pearlash, and three pails of melted soap. Make two equal lots of the damask, and go on cleaning one lot, then the other, in the soap liquor in the tub. When this is done, make up another soap liquor exactly like the first, and clean the two lots in this, letting the last lot go first this time. When this is done get them up to drain, and give them a similar soap liquor, but with less ash and soap in it. This is the thin liquor; put them through this, and fold up to drain (not rinse), and put three parts of a pint of vitriol in a forty-gallon, very clean copper of scalding hot water and one pint of muriate of tin. Open the damasks and handle them in the preparation for an hour; it must not boil; and get them up, cool, fold, and put on the pegs to drain, not rinse (see pegs, page 22). Now throw away your preparation, scour the copper well, fill it with clean water, and put in fourteen pounds of fustic chips, make it boil fifteen minutes, and put in a pound of ground alum, and a quarter of a pint of Saxon blue, and see that your dye-stuff is two shades darker than your pattern, in a clean white saucer; if not, give it no more fustic or alum, but more blue, till it is. Open your damask, put in the copper and boil it well for an hour and a half,

well handling it all the time ; then get it up, cool it in three cold waters, dry it, press it, and it is done.

*Watering Moreens by Steam in a Cylinder Calender.*

Moreen is a strong, plain, wove woollen fabric, with the weft much thicker than the warp, from twenty-two to thirty inches wide, is plain both sides, and is principally manufactured from Lincolnshire and Yorkshire long wool ; it is dyed at Leeds and Bradford, in Yorkshire, and is seldom used for any other purpose than bed and window curtains. Of late it has been much used for ladies' petticoats. When it is wove and dyed it is not fit for use until it is finished, and is mostly watered.

The watering is done at Manchester, in a friction calender, by steam.

A friction calender has three rollers—two paper and one hollow polished cast iron one, called a cylinder, between the two paper ones ; this cylinder is about half the size of the paper rollers, is heated by steam, and must be hotter than a common smoothing-iron when in use, before it is fit for work. To give some idea of the power that is required for watering moreens, an iron flattening-mill is generally on the same premises, and worked by the same steam engine.

The moreen, when it comes to be watered, is doubled, that is, two pieces are placed face to face flat, put through a conroy, and rolled on a spindle. A conroy is a frame of wood, two feet six inches high, three feet wide, and four feet long ; it has wooden rails across it, one higher than the other, and through these rails it is forced by turning it on the spindle ; and by passing it through this conroy it is stretched, and the warp wift edges made regular and fit to go to the engine for watering. Now these two pieces of moreen have been put through the conroy on the spindle, the spindle is brought over to the calender, and put on the sockets.

Now that the calender is going, the man takes the ends of the two pieces that are double on the spindle,



and puts them flat on the bottom paper roller, and pushes them gently under the cylinder, which nips them, and as they roll through a man receives them at the other side, lifts them on the cylinder, and pushes them on top of the cylinder, and under the top paper roller—these two rollers nip them, and they roll through; as they come through they are lifted on the top paper roller, and as they roll over it they drop into a basket without any assistance, and they are done so far on one side; the other side has to be glazed, and the basket is now turned over again to the man at the front, and he reverses the moreen, and puts it through again in exactly the same way as the first time, and it drops into the basket finished, glazed on both sides, and watered in the middle. The basket or spindle is now taken to the makers-up or folding-room, and the two pieces are taken asunder, measured, and rolled separately, the number of yards put on it, papered, and it is ready for sale.

Instead of a basket for the work to drop in, in some calenders there is a small spindle, worked by steam which it rolls on, as it comes over the top of the paper roller. It is better than a basket, and this moreen that has been bed and window curtains, cleaned and re-dyed, is also watered in the above way.

### *Description of a Friction Calender.*

The friction calender has three rollers, hollow steel, solid paper, and polished cast iron hollow; it is called a steel roller or cylinder; it is turned or heated by steam on red hot cast iron rollers, like window weights is put into the hollow centre of the polished steel roller or cylinder and when this steel roller or cylinder is sufficiently heated, send the work damped, stretched, rolled on a roller, and ready to finish. The three rollers are tightened by a screw at top ends of the rollers, and the furniture cotton is laid singly and flat on the lower or paper roller, and the fingers gently move it forward to the steel roller, all now in motion, and both rollers nip the ends

that the fingers push to them and carries it through to the other side and drops it in a basket, while the piece of cotton is carried through the rollers by the rotary motion of them ; a man is smoothing it as it passes off a small roller that it has been stretched and carefully rolled on a spindle through a conroy before it. Old work is seldom conroyed, before it comes to the friction calender to be finished. This calender when in work will finish an immense quantity of work in a short time, and while it is at work it must not stop for a moment, or the hot polished steel roller will damage the work, or the paper rollers that are above and below it—and when the calender has done its work the screw that tightened it is now used to lift the paper rollers from the steel one, and it is alone between the centre of the two and the heaters drawn out, if heaters are used. The printed bed and window furniture for this kind of finish must be taken apart. There must be no seam in it. It must be well cleaned and stiffened, say half a quartern of flour and half an ounce of beeswax, made into starch, is enough for 100 yards ; it must be hung up to dry very straight as the calenderers will not pull the lugs out that it will get in careless drying—they will calender it nearly in the same shape as you send it to them. The print ought to be damped and the breadths and pieces pulled but straight before they are sent to the calender.

This friction calender finishes all sorts of colors of woollen and cotton, and when stiffened with a water starch it finishes better, and woollen damasks for a nice gloss and evenness of finish is very superior to pressing, and it also stretches the damask very much and has a nice feel.

Entirely silk damask, any color, I would recommend to be damped and brushed, and not framed by any means, but sent to the friction calender for a finish. The calender man must not screw it down as if it were cotton. In London, Manchester, Edinburgh, Glasgow, Belfast, and Dublin, there are these calenders, and Baverstock, Great Russell street, Bloomsbury, is a practical

hand at this work. The above work is now and always was, sent to the hot pressers for a finish ; what are dyers to do but finish in this way if they prefer it ; it is all taste, the work must be finished.

### *Silk Watering Machine.*

This machine has three rollers, exactly like the friction calender, but much smaller, and may be turned by a handle and cranks instead of steam ; some waterers prefer cherry tree rollers for watering silks. The silks for watering are put into the watering machine double, that is, two breadths of silk are tacked together (not by the ends or sides but on top of one another), and so they are put through the machine, and when they come out that part, the middle, that has not touched the machine is watered, and that part that has, is glazed. The goodness or badness of the watering depends entirely on the quality of the silk, the proper heating of the cylinder, and matching the warp and wift of the silk. A small steel spring is worked on the rollers under the silk while it is going through them ; watering done without this spring is not so good.

### *Moreen Watering Machine.*

This machine has three rollers like the friction calender, it has this difference, the hollow steel roller is cut so as to exactly imitate watering, and when the heater is put in and the work is passed through the rollers, it comes out watered by the pressure of the other two rollers and the heat of the steel roller. This also may be turned by hand or steam.

### *Moreen Striping Machine.*

This machine has three rollers, but the hollow steel roller is cut with one stripe of watering and one stripe polished, one inch and three-quarters apart, that is to



say, the watered stripe is one inch and three-quarters wide and the satin stripe is one inch and three-quarters wide; these stripes are cut round the roller thirty inches wide. Moreen finished like this looks very well, and imitates satin striped tabberett. This is worked like those above with iron heaters for the cut steel roller.

*Moreen, Utrecht Velvet, Cotton Velvet, Silk Velvet, and Silk Embossing Machine.*

This machine has three rollers like the other machine. The steel roller is cut with a round flower or a leaf on it. We have two calenderers at the west end, one has a round scoloped flower, and the other a leaf pattern, the flower has the preference. These patterns are cut round the steel roller at proper distances, where the flower is not the other part is polished, and is called the ground. The patterns do not, of course, cover the roller. When the work comes out of the machine finished, it has a proportionate glazed ground, with a three and a half or three inch flower on it. Also the silk embossing roller is very different to the moreen embossing roller. It is a very delicate affair, and would make but little impression on moreens. This machine is worked exactly like the others, by steam or heaters.

*Hydraulic or Common Hot Press for finishing Woollen Fabrics, Shawls, &c.*

This press is made of well seasoned oak, sides, top, and bottom, with a nut and screw, iron plates and press papers; there must be two sorts of press papers, one sort plain and one sort glazed. The plain papers are for pressing cloths, shawls, coburgs, and merinos, and the glazed papers are for watering moreens and silks. There is another method for watering moreens and silks. When the work is cleaned, dyed, picked, brushed, and ready for pressing, it is put on a long smooth board, and a press paper is laid on the board, and a piece of cloth

is smoothly laid on it, then a press paper is put on it, then another piece of cloth on this paper, and so go on, one paper and one cloth, until it is one foot high. Now put it one side, and begin again as at first, and when there is enough work in the papers to fill the press, begin to do so. The iron plates are the size of the paper, a quarter of an inch thick; they are in two, sometimes in three parts, for convenience of lifting about, and are heated either in an oven made for the purpose, or on top of a stove. A very good way, and a clean and cheap one, is to have a common metal boiler for hot water in the dye-house, and put the press plates into this boiler; get it on to a boil with the plates in it, and they are ready for use. In a garment dyers, this method of heating press plates is very handy and cheap, for the water is not soiled if the plates are kept clean and in a dry place. The best method to keep three press plates and boiler always clean, is to boil the plates in this iron boiler, and soap and ash for a couple of hours, then draw the fire, and let the plates stop in the liquor in the copper until it is cold, then get the plates out, scour them well with a brush and soap, dry them, put them by in a dry place, and they are fit for use; do the same with the metal boiler they were boiled in.

These iron plates when heated are put on the bed of the press, and the first lot of press papers that has been filled with work is put on them, and then on this first lot is placed another layer of plates, and on these plates another lot of press papers filled with work, then on top of this a layer of plates, and so on, until the press is filled; it is then screwed down and left for the night, and in the morning the papers are emptied and the work shifted, that is, the part that has been over the edge of the paper is now put into the papers, that is what pressers call breaking the cutting, and when this is done the work is put back into the press in the same way it was put in at first, screwed down, and left for twelve hours, then got out, folded and it is finished.

Moreens for watering are placed face to face, and put

in glazed press papers, filled exactly like the woollen cloth papers, the plates are hotter, and the press is screwed down much tighter; these are also shifted. Silks are also watered in this press by placing them face to face like the moreen. This is the old method of watering silks and moreens, and is still continued, but it is not so good by any means as the watering that is done by the cylinder calender.

### *A Cylinder to finish Merinos and Coburgs.*

New pieces of merinos and Coburgs are spun and wove from the wool, then dyed, pressed and finished; but for the one piece that is finished by the hot-press there is a thousand done by the cylinder calender.

Ladies' merino and Coburg dresses, when taken apart, are also hot pressed for a finish.

Shawls and scarfs of all sorts and colors, when cleaned or dyed, are also hot pressed for a finish. Some dyers damp, pick, brush, and finish the dresses and shawls on a pair of wooden rolls, in strong drill, or Suffolk hempen sheets, by putting the breadths and pieces double inside the doubled sheet, and pinning the end of the breadths, the body, and sleeves in proper shape, the sheet is on one roller, and the end fastened on the opposite one, and as the sheet is filled it is rolled on the empty roller, and as it passes from one roll to the other the sheet is pressed on a hollow iron pipe, with heaters in it like an Italian iron, and this hollow polished iron pipe is called a cylinder, and when the sheet is filled, it is passed over the cylinder again from one roll to the other, and when thoroughly dry the sheets are rolled off the rollers, and the dresses taken out of the sheets as finished, and are ready for the customer.

Another and the most general method is—some dyers damp, pick, and brush these dresses, and iron them on the wrong side with the heaviest flat smoothing or hatters' iron, and the face to the ironing blanket. Others use box-irons, with a fine cloth or width of Persian be-



tween the iron and the merino; it takes away the appearance of the iron on the work, but is a slow process.

*Pitch Calender to Moire Antique Silks.*

Silks to be moire antique must be wove for that purpose. Any sort of plain silk will not moire. It is done in a pitch calender, and afterwards hot pressed in papers. A pitch calender is in every respect, working it also, like a mangle, with rollers, hempen sheets, and a board bed; but the friction calender is five times as large, and is worked by steam or horse power. It is not a new invention, it is as old as time, and I am sure the mangle is a copy of it. However, a mangle is a small friction calender.

When silks are to be moired, they are doubled in two, that is what is called faced, the sheet is spread out, and a couple of turns of it put on the roll; now the silk is put on the sheet and plaited, nipped in equal distances across the width and length of the silk. As this process is going on, the sheet and the silk is rolled on the roller, and when the roller is full, it is put under the calender, and another roller filled and put under the calender, it is now put in motion, and well worked backward and forward, the silk in the sheets on rollers under it. When this is done the calender is stopped, the rolls taken out and unfolded; the silk is now in an awfully pinched state. It is now folded as smooth as possible and put between papers and hot pressed, shifted and pressed again, then taken out of the papers, folded, nicely papered, and sent to the customer finished.

## CHAPTER III.

## THE ART OF DYEING AND SCOURING.

*Cotton in its Natural State.*

COTTON is inclosed in a shell or a pod that grows on a tree called the cotton tree that is found in America, the Indies, Persia, and Egypt. In some countries the pod ripens annually, in others every two or three years. The pod must be broken to take the cotton out of it, which is of a woolly or downy substance, and weighs about an ounce. It is of a drab color, and has much vegetable oil, which makes it very dangerous from its inflammable nature. Gun cotton is made from it and diluted oil of vitriol. It is porous like wool; but the pores are not large or globular as in wool—they are flat and hard to open, and that is the reason of the difficulty in dyeing. There are many different growths and as many different sorts, which will be seen by my list of prices at the end of this book. At the time it was introduced into England it was talked of quite as much as the gold discoveries of the present day. It was known in this country for centuries before we worked it; but ever since we began to do that, we have not been idle. We may thank the Dutch for the introduction of calico printing. Sir Robert Peel's great grandmother was the first woman that ever went to church in England with a printed cotton dress on, and that dress was a present to her from Holland, and was the making of Lancashire. Chat Moss would never have been what it is but for that dress. However, a hint is never thrown away on a Lancashireman or a Yorkshireman, and they took it. See now the result—riches and prosperity. The cotton tree made

England and America industrious, from the very simple cause of having to work hard, both in body and mind, to make it productive of value; while the Spaniards, by getting gold without having to work hard for it, became idle and degenerate.

*To Dye Cotton Pale Blue or Chemic Blue.*

Cotton goods for pale blue must be white, pink or pale blue; they are very well cleaned and boiled off in soap and soda; and if a bad white, must be bleached; and if bleached, must be well rinsed and have a strong hot ash to take the oxy-muriate out of them, for if there were only a trifle of it left in them, it would bleach the blue you dyed them with out of them. In the drying, when you give it the ash, you must rinse the ash out of it, or it will be almost as bad as the lime. Give one cold water out of the ash, and another cold water to taste pretty sharp of common sour; give it ten minutes' good handling in this, and give it a cold water out of it, and it is ready for dyeing.

We will suppose there are thirty yards of cotton, and we will begin by scalding a pint of Saxon blue (see page 60), and half fill a long cask that will hold about six pails of clean water; put the scalded blue in this, and have a clean stick, a lump of chalk, and a knife; scrape the chalk in the cask with the blue in it, and as you go on scraping the chalk in, keep stirring it with a stick until you have neutralized it—do not make it flat but rather sharp—very little. Put in as much melted alum as will make it taste, and leave it for the night, and hang up the cottons to dry; if you do not like the blue in the morning do not use it, or you will have the work gray; give it a good stirring, and see if it is as you wish; if it is, leave it for three or four days without touching it during that time. Now it is fit for use. Turn four pails of it into a kettle, and make it taste slightly with a little tartaric acid, and a little alum; stir it well, and leave it while you make a pound and a half of the best starch in



a little copper kettle, with a pail of boiling water; put this starch kettle to swim in a boiling copper; stir it well for five minutes, and put a pailful of blue on the top of the starch while swimming in the boiling copper; stir it well until it incorporates with the white starch, and then take it out of the copper, and if the starch kettle holds four pails fill it up out of the blue in the kettle. Now have the small clean punching tub and strain the starch and blue into it, and put the now dry white cottons into it; and dye them pale Saxon or chemic blue. Handle them in this for twenty minutes, and when they are an even blue all over, wring them up and hang them in a place where they will be soon dry, to return them again in the morning without anything being added to the blue liquor. Handle the blues well in this until they are well wetted out, wring up very gently, fold up and put them in a dry clean blanket to regulate for a couple of hours, and hang them up with care, and when they are dry have them glazed, and they are done. The blue you used to dye these is thrown into the old cotton green liquor, and that left in the kettle thrown in the blue tub; fill up the blue tub with clean water, add a little fresh blue to it, and it will be ready in a couple of days to dye another lot of Saxon blues.

REMARKS.—This may appear a long process, but I had to get everything ready from the first; the next that I would have to dye this way I have only to make my starch, turn the blue into it, and go on dyeing, my preparation being already prepared.

N. B.—I have two more lots of blues that I intend to dye two different ways.

#### *Another way to Dye Cotton Saxon Blue.*

Clean and dry this thirty yards of cotton for blue, as you did the other lot, and scald half a pint of blue in one pail of water, and put the blue blankets in it; lift the kettle in the boiling copper, give the sheets a turn, and leave them to suck in the blue, while you mix up a

pound and a half of the best starch, in very little clean water ; put it by, and take the kettle out of the copper, with the blue blankets in it, and put them to drain over the kettle. Put in the blue liquor half a teacupful of alum, and two ounces of tartaric acid ; stir them well, and lift the kettle into the copper ; after the kettle has been in the copper ten minutes, put in the starch you have mixed, stir it well and leave it while you clean a small puncher-tub and sieve to strain it through. Now take the kettle out of the copper, and let it swim in a tub of cold water until it cools, and when it is cold enough, strain it through the sieve into the tub, and dye your blues in it. When they are well wetted out in this blue liquor, which will occupy twenty minutes, get them up, wring, and dry them in a hot room, and in the morning, when they are dry, return them again in the blue liquor ; work them well in this for twenty minutes, and wring them up, and dry them, and when dry have them friction-calendered.

REMARKS.—This is an easier and better way to dye blue than killing the blue with whiting or chalk. It took a pint of neat Saxon blue to dye this work with chalk, besides the time it took killing it, and having to wait for two or three days, whereas in the blanket blue, I dyed them in about two hours.

*Another way to Dye Cotton Saxon Blue.*

Your cotton being cleaned and dry and all ready, make a pound and a half of the best starch in three pails of boiling water, put it to swim in the boiling copper, and put in it half a teacupful of ground alum, two ounces of tartaric acid, and half a teacupful of Ballsall-heath powder blue (see page 60); stir all these well in the kettle, take it out of the copper, and put it in a tub of cold water to cool, and when cool enough strain it over in a clean tub and handle the work in it, and dye it a pale blue ; give it twenty minutes in this, wring it

up, and dry it in a hot room, and when dry return it as you did the other blues, and send it to be finished.

REMARKS.—This is the cheapest and easiest way, besides it produces a much brighter and better color.

*To Dye Cotton Furniture Lining to imitate Dark Blue dyed in an Indigo Vat.*

Clean, rinse, spirit, and give it a cold water out of spirits; now dye it pink with safflower;\* it must be a full pink; wring it up out of a sharpish tartar as dry as you can, and dye it a pale blue with the blue of any of the three blues above that you like to use, no matter which, and when dry put one ounce of tartaric acid in the liquor before you put the work back; handle this well for half an hour, and wring it up carefully, and let it lie in a clean dry blanket for a couple of hours, to regulate before you hang it up to dry, and when dry, send it to be calendered or glazed. Mr. Baverstock, of Great Russell Street, Bloomsbury, friction-calenders cotton goods to look as stiff and glossy as new.

*Manufacture of the best Starch.*

Starch is a very important article to the dyer, without it in some shape he could not finish his work. In preparing starch in the manufacture the grain is steeped in water until it becomes soft; it is then put into coarse linen bags, which are pressed in vats of water, a milky juice exudes, and the starch falls to the bottom of the vessel; the vats are then allowed to remain undisturbed for some time, by which the supernatant liquid undergoes a slight fermentation and becomes sour; this is an essential part of the process, since the acid thus formed dissolves some of the impurities in the deposited starch; the sediment is then collected, washed, and dried in a moderate heat, during which it splits in the columnar fragments, which we see in the papers.

\* See description of Safflower.



The pure starch is not soluble in water unless when heated to  $160^{\circ}$ , and if the temperature be raised to  $180^{\circ}$ , the solution coagulates into a thick transparent jelly. This fact is one of great practical importance, and will suggest to the operator the necessity of regulating the heat in all those processes in which the perfect solution of this principle is required; the neglect of this precaution has frequently proved a source of loss of time and vexation to the dyer.—From 'Paris's Chemistry,' see page 485.

*Directions to make Starch from Flour.*

Have your copper boiling with clean water, and scour out a small kettle, put a quartern of the best flour in it, and beat with a little clean water until it becomes a thick liquid, there must be no lumps in it. When ready pour into the kettle two pails of boiling water, well stirring it all the time, and leave the kettle to swim for half an hour in the boiling copper; then get it out and use it. This is what the dyers call the best flour starch. I think it necessary as we use so much flour, and this makes the best starch, to compare the strength of both; and I find that one quartern of the best flour will stiffen as much cotton goods as three pounds of the best starch. All cotton goods ought to have the best starch, and all printed furniture with white grounds, particularly those that are made up, such as chair and sofa covers. The best starch is made exactly the way we make the flour starch.

*To make a Cotton Blue Vat.*

The cotton blue vat is to be made three feet wide, four feet long, and five feet deep; the bricks to be laid on the flat. One part sand, one part cement, is to be used instead of mortar, and plastered with the same inside and out. It must be made in the beginning of summer, and left to dry for a couple of months; at the end of that

time it will be cracked all over—you must not mind that; now all these slight cracks or slits are to be filled up with two parts of cement, and one part sand, and directly after that, it is to get a coat of sand and cement a quarter of an inch thick all over, inside and out. In the building of it there must be pieces of iron hooping all round it, built in about a foot from the top. There is to be a yellow deal frame all round it, four inches wide and two inches thick. The top of the vat is to have a layer of sand and cement, mixed all round it; the frame is to be laid on with this, well fastened down with the iron loop-holes in the hoops, and good strong nails. It should be sunk about two feet in the ground, for a man cannot work a vessel five feet high, particularly in dyeing old work fast blue, for it is not put on a frame as the new work is, but it is put into the vat and worked under the liquor by the dyer, his arms being up to the elbows under the liquor all the time the work is in the vat, which is generally twenty minutes. Three feet from the ground is high enough for a man to work at a vat. There must be a frame, hoop, rake, and lid, as in the woad vat. It was this sort of vat where I was working some years ago; I thought it a clumsy affair, but the master told me it never leaked, and that every time the drugs were put in it, it made it stronger. The wooden vats take up nearly as much room, cost quite as much in making, and have to be generally repaired once a year.

If the dyer should prefer a wooden vat, any brewer will tell him where a vat maker resides. A slate vat will do exceedingly well, but it must be sunk in the ground, and well grouted in with hot lime and the earth that is taken out of the hole; then you do not trust to the irons that fasten it, and it will never leak or want repair.

#### *To Set a Cotton Blue Vat.*

Clean out a little copper that will hold five or six pails of water, fill it up and make it boil; slacken fifteen

pounds of lime in a clean tub, and when slackened put two pails of clean water on it, rake it well and leave it; now put five pounds of ground indigo into a clean copper kettle; mix it as you would flour with boiling water, into a thick liquid and leave it. Take four pails of boiling water, and pour it on the top of twenty pounds of copperas in a clean kettle; stir this well, and cover it over, so that the gas in the copperas does not escape.

Now put in the little copper to the two pails of water that is in it, a bowlful of bran, and eight pounds of pearlash; stir this well till it is melted, and put in one-half the lime, well stirred up before you turn it over; now put into it all the indigo mixed in the kettle, fill up to within one pail of the top, and boil these well for one hour, never leaving the copper lest it might boil over, well stirring it with a clean stick all the time. When the hour is up draw the fire completely from under the copper, and fill up the copper with the remainder of the lime. Slacken eight pounds of lime in the tub, and put two pails of water on it, stir it up and leave it; have a large tub well cleaned out, and put the lime with the copperas into the kettle, and the indigo ash and lime you have just boiled up in the little copper; rinse all the vessels into the tub; rake this up and leave it.

This new blue vat will hold sixty pails of water; put forty pails in now, and leave it until the next morning; in the morning rake your tub with the materials for the blue vat in it well; and turn it over directly into the vat, and rake it up well; rinse the tub into the vat, keep on raking for half an hour, and leave it covered over until the evening, and then rake it well, fill it up with clean water, and it will be ready to work in a few days. Wet out your work before you put it in the vat.

#### *Another Method to Set a Cotton Blue Vat.*

Clean out a tub that will hold about ten pails of water, slacken one bushel of lime into it, and cover it over



while it is slackening ; put six pounds of ground indigo in a kettle and mix it into a liquid paste with clean hot water, and then put four pails of boiling water over it, well stir it, cover it over, and leave it. Now have another clean kettle, and put twenty pounds of copperas in it; four pails of boiling water on this; stir it well with a clean stick, cover it over, and leave it. Put four pails of water on the top of the lime that is slackening, rake it up well, and now put in the melted copperas out of the kettle; rake it up well, and now put in the indigo; stir it well, and cover it over, and leave it for a couple of days, stirring it occasionally. When it is ready to turn over, half fill this new blue vat. The instructions to turn all material that is in the tub, to make the blue vat, are the same. Rake it well, and while you are raking it fill it up with clean water, and continue raking it for an hour; cover it over, and you may use it the next day.

Your furniture lining is to be cleaned in the same manner as the pale blues were for dyeing, but not dyed. Open out your work in lots of six or seven yards each; gather one lot up by the selvage, hold it tight in one hand, lift your hand over your head, go to the vat and drop the selvage end you have now hold of straight into the vat, your hand dropping with the work; when your hand goes under the liquor, still holding the work tight, open it all of a sudden, and thrust the disengaged arm gently under the cotton to prevent it from dropping on the net. Now look to the clock, and give the work ten minutes; do not lift it up in the liquor until you are ready to take it out. While you are abiding your time, keep handling them with your arms spread out under the liquor, and taking hold of an opposite selvage with each hand throw it from you until you come to the end, and then bring it back to you. When the ten minutes are up, gather it up by the selvage, with both hands under the liquor, lift it up, and give it a very quick wring; come away from the vat, and expose it with all expedition to the air, and it is instantly changed to blue. Five

men can work at the vat at the same time—that is, one man for each end and two for the sides, and one man rinsing; that would be twenty-four yards for every half hour. There is a frame for new pieces that I have described in the woad vat for woollens (see page 190); when all the work is through the vat the net is drawn out, the vat is raked, covered over and left ready, in a day or two for working again. When a new vat is worked five or six times, it is helped with about a quarter of the same materials it took to make a new one.

When the cottons are all dyed, we give them a water, and then a common sour, to take the lime out of the work and clear it; a couple of warm waters after the sour, starch it, and hang it to dry; and when dry, take it down, fold it, and send it to the glazers or calenderers, and it is as good as new. This is a color that never washes out.

*To Dye Cotton Dark Blue with Nitrid of Iron.*

This cotton furniture lining, or other cotton goods, must be cleaned the same as the other blues, and not dried. For the above thirty yards when white put in a clean tub six pails of clean hot water, and two pints of nitrid of iron; handle them well in this for half an hour, get them up, rinse them, and melt half a pound of prussiate; have a small tub, and put six pails of warm water in it, and half a pint of spirits of salts; handle the work well in this, the prussiate, for twenty minutes; wring it out of this, and put it in the nitrid of iron again; give it twenty minutes, wring it out, rinse it, and put in the prussiate again, and so go on repeating it from one to the other, until it is made the blue wanted, no matter how dark; when it is dyed enough, take it out of the nitrid of iron, and rinse it in two clean waters, stiffen it in the best starch, dry it, and return it into the starch when dry, well open, and handle it, wring it up, dry it, and have it calendered.

REMARKS.—This is a very pretty blue, but a very tire-

some color to dye ; although a very pretty blue there is no indigo in it ; the blue is prussiate of potash, a dye which I will presently give a short account of.

*To Dye two yards of Pale Blue Cotton, ten yards of Yellow Cotton, ten yards of Drab Cotton, Green, in the same Dye Liquors, together.*

Clean all these together in one punching tub, and boil them all off in one copper of strong ash and soap ; they must boil well in the liquor for one hour, and they are to be handled well with a stick, and kept under the liquor all the time. Now get out of the copper into a thin soap liquor, and punch them well in this to take the soap and dirt left in them, wring them well out of this liquor, and make a strong sour in a kettle with six pails of warm water, and handle them well in this for twenty minutes ; now get them up and give them three clean cold waters, and boil up fourteen pounds of old fustic chips in a copper that will hold six pails of water, twice, that is the first and second boil is to go into one clean tub together, and when you are boiling the fustic, put one pound of soda in the first boil with the chips ; this is to answer two purposes, that is, to draw the color out of the chips, and if there is any of the spirit remaining in the cotton it will draw it out of them ; the two boils are to be passed through a sieve into the tub. Take all the cottons in one lot and handle them well with a stick into the fustic liquor, neat as it is, and handle them well in for half an hour ; tell your man to clean the copper, and fill it with clean water, and get it on to a boil, and save the chips. When the half hour is up have another tub and put eight pails of clean water in it, and melt two pounds of ground alum, and put it in the water in the tub. Now take the work up out of the fustic liquor, and handle it well in the alum liquor for twenty minutes ; wring it out and give it one clean cold water, and put it back in the fustic liquor again, handle it well in this liquor for five minutes, and



leave it and look after the starch and blue which is to follow.

Have two pounds of the best starch, and mix it in a small float in a clean pail, and draw off in boiling water as much blue from the blue blankets as you did to dye the thirty yards of pale blue cotton. Now put your kettle to swim in the boiling copper, and put your starch in it; stir it well and leave it, and take up those for green out of the fustic, and throw the alum and fustic away; take the blue kettle out of the copper, and put a teacupful of ground alum in it, and half a teacupful of tartaric acid, and cool it; strain into a clean tub, and handle the work in for twenty minutes, and wring it and hang it up to dry in a hot stove room, so that it will be dry enough to take down in the morning, and return it again in the same blue liquor; handle it well in this, wring it up and fold it for a couple of hours in a sheet, hang it up to dry, and when dry sort the three different lots, and send them separately to be glazed or calendered, no matter which, as they will look well either way.

REMARKS.—Dyers in general save the old green liquor, but do not think it worth saving when the work is returned; the reason of my returning the work is that all greens, blues, and reds improve in cloth, color, and stiffness by so doing. They finish soft if they are not returned.

*To Clean and Re-dye forty yards of Green Cotton Lining.*

This must be cleaned well and all the old color boiled off it in strong ash, and spirited sharply in six pails of water, in a kettle, and three cold waters after the spirits. Boil up a pail and a half of old fustic chips, with soda in it twice, through a sieve, into a clean tub; get it in this fustic liquor, melt two pounds of ground alum, give it time in the alum; get it up, rinse and return it in the fustic. Make the blue and starch in the same manner, and two pounds of the best starch will do for this. Blue it after the yellow; dry it and return it in the blue;

when dry it is ready for glazing. If we want it a full green we put it through the alum and fustic twice; by doing so you will take up all the fustic. Pale green is done by letting it follow from first to last in these liquors. When the cottons are for a bluish or very pale green, we make (suppose for twenty yards) a pound of the best starch in a pail of boiling water, and put the kettle to swim in the copper; then put in two bowlsful of killed Saxon blue out of the blue that was killed with chalk, and three bowls of boiled fustic liquor; if you have no fustic liquor handy, boil up a pound of old fustic chips, in four quarts of clean water—no soda in it, and strain into the starch blue. Now put a tablespoonful of alum in, and the same of tartaric acid, and handle them in this liquor for ten minutes; wring it up and dry it, and when dry return it again in the same liquor; give it twenty minutes in this liquor, and wring it up, fold it, and hang it up. There are some re-dyed green cottons that do not want cleaning; when that is the case, we put them in the old green liquor cotton tub, dry as they come in, handle them well in this, and leave them for three or four days, turning them over every day; wring them well out of this liquor, and dry them, and when dry, make up a clean starch, fustic, and blue liquor, allowing one pound of starch for twenty yards, two bowls of blue liquor, and three bowls of fustic liquor, with a little alum and acid; put them through this, rinse, and dry them, and they are done.

*To Dye twenty yards of Cotton Furniture Yellow.*

Cotton to be dyed yellow, amber, or orange, must be well cleaned and boiled off in ash and soap, and rinsed from the soap. For this twenty yards of cotton lining for yellow, clean out a tub and put one pound of alum in it, and two ounces of blue stone, and eight pails of water; handle it well in this preparation and leave it for three or four hours, and boil up half a bundle of weld in five pails of water, with one pound of soda in it, twice;

pass this through a sieve into a clean tub ; get up the cottons for yellow out of the preparation, and rinse in two clean cold waters, and handle them well in the weld liquor for half an hour ; if they are the yellow you require them, take them out, rinse, starch, and dry them ; if they are not dark enough, put them through the preparation again for twenty minutes, take them out, rinse, and return them into the weld liquor, and they require twenty minutes in it. By this time they will be the usual yellow that weld by itself makes on cotton ; get them up, rinse, starch, and hang up in a warm room, and when dry have them glazed.

REMARKS.—These are considered the finest yellow that are dyed with any yellow drug. Some dyers clean them well in clean soap liquors, after they are dyed, and wring them out of a warm soap liquor, dry them, and stiffen them when dry. Sometimes we work a little turmeric in with the weld, but it all depends on the pattern you have with the work.

*Second Method to Dye the above.*

Put one pail of old fustic chips into a copper that will hold five pails of water, and one pound of soda ; boil well for half an hour, turn this over into a clean tub through a sieve, and boil it well for half an hour again ; now turn this over, and tell the man to clean the copper and get it on to a boil, while you go on by handling the cottons well in this fustic liquor, boiling hot, with a clean stick, for half an hour. Melt one pound of ground alum, in eight pails of water ; take the cottons up out of the fustic and handle them in the alum for twenty minutes ; get up and rinse in two cold waters, and return them in the fustic for twenty minutes longer, and if they are full enough, get them up, rinse, and starch them ; if not, run them through the alum for ten minutes, get them up, rinse in a couple of waters, and return them in the fustic liquor for twenty minutes, and they are done.

Flour starch will do very well to stiffen this work ;



the reader will please to notice that these colors do not require the best starch—flour starch is best for them always.

*Third Method to Dye the above.*

Have a clean tub, and half fill it with boiling hot water, say about eight pails, put in this one pound of alum, and one pint of bark spirits; handle the cottons well in this liquor for twenty minutes, and leave them while you put two pounds of North American quercitron bark in a small copper in five pails of water; boil it well, and strain it over into a clean tub, and give the bark another boil, and turn it over again in the same liquor. Now take up the work out of the alum, and rinse it in two clean waters, and handle it in the bark liquor, scalding hot for twenty minutes; take it up, and return it in the alum for twenty minutes, get it up, rinse it, and return it into the bark liquor for twenty minutes longer. Throw away the alum and bark liquors, and rinse the work well in three or four clean waters, and starch it, hang it up to dry, and when dry, have it glazed.

REMARKS.—This is the bark Mr. Bancroft found out in his experiments on coloring matters; he was very proud of his discovery, and he had a right to be, for there is not one fault in it; with the commonest attention in the rinsing, it is sure to turn out well. It will work with indigo or cochineal, and although it is as cheap as young fustic, it is not much used.

*Fourth Method to Dye the above.*

These cotton furniture linings are boiled off first in soap and soda, and well spirited out of a thin liquor of soap, rinsed, and put on the horse to drain, ready for dyeing. Now dye them. Have a copper that will hold twelve pails of water; scour it out well, and fill it with clean water; make it boil, damp the fire well down; now put in the copper for the thirty yards two pounds of tur-

meric, stir it well for five minutes; now open out your work, and put it in the copper, and handle it well all the time with a clean stick; tell your man to make three parts of a quartern of flour into starch in a pail and a half of water, to stiffen it. Now your half-hour is up; take up the yellows out of the turmeric copper, and make it taste with sour, not too sharp. Put the work back in the turmeric, and handle it well in it for ten minutes; get it up, and rinse it in two clean waters, with a little sour in them; wring it well out of the last water, starch it, and dry it, and when dry return it, and before you return it, put an ounce of tartaric acid in the starch, scalded in a teacupful of water; handle the yellows well in this same second starching, wring them up, fold, and hang up to dry, and they are done.

REMARKS.—This is a very ready way of dyeing or re-dyeing these cotton goods—the work wants no preparation, no boiling of drugs twice to get the dye-stuff out of them; it is only to put the turmeric in the copper, and handle in the work, and you have yellow at once—any depth you like—it all depends on how much turmeric you put in the copper; if you put in little, you will have a light color, and so on. There is a little judgment required in the starching, but all I require of you is to abide by my instructions.

*To Dye ten yards of Cotton Buff, ten yards of Cotton Leghorn, and ten yards of Cotton Amber.*

The cottons to be dyed this color must be light, and well cleaned before you begin them; they need not be boiled off in soap, for they will be dyed in soap, in a boiling copper, that will take them one at a time. Boil up half a pound of annotto in two quarts of water, and two ounces of pearlash in it, and put it convenient to you. Now clean out a small copper that will hold five or six pails of water, and make it boil, and begin dyeing the buff first; put in your copper one pint of the boiled annotto, one pound of the potash, one bowlful of the

neat melted soap, so as to make a strong soap liquor; now take the buff first in the copper, and boil it well for full twenty minutes. Tell your man to make you a hot thin soap liquor in a small tub; take this out, put it in the thin liquor, handle it well in, and give it to be rinsed, and then give it a thin liquor of fustic, and put on a clean horse. Now take the leghorn and give it half a pint of the annotto; put in the copper and boil it well for twenty minutes, put it in the thin liquor, get it up, and give it to your man to rinse; tell him to make the fustic that he dyed the buffs in taste sharp with sour, and handle the leghorn in it for ten minutes. Get it up, and throw the liquor away. Give it another weak fustic cold for twenty minutes; get it up, and put it on a clean horse (not near the buffs). The next color is the amber. Put half a pint of annotto in the copper; put in the cottons for amber, and boil them well in this for half an hour. Put them in your thin liquor, handle them well in this; give them to your man to rinse, and put on the horse to drain. Now put all the annotto into the copper, and give it a good boiling; put also a little more soap in it, as it is rather flat with the work that has gone through it. Then damp the fire, and turn the copper over into one of the puncher tubs to dye a dozen yards of old rich fashionable prints, with a white ground buff. Tell your man to scour the copper well, fill it up, get it on to a boil, and make a quartern of flour into starch while you clean and dye the print. Begin the print by cleaning it well, and then dyeing it in the annotto that is in the tub; it must not be more than hand heat for the prints. Having dyed the white ground of this print buff in this liquor, give it the annotto thin liquor, rinse it, give it a couple of bowls of fustic in a clean kettle, and cold water. Wring up the print, and proceed with the starching. Starch them in different lots, beginning with the buff first. When all are starched, send your man to hang up what is stiffened, while you put half a pound of turmeric in the little copper, fill it with scalding water, and dye the amber. Put



the amber in this, and handle it well in it for twenty minutes. Get it up, and put in the copper a little sour, so as to make it taste, and return the work. Give it ten minutes in this, and get it up, rinse; starch, and return it. When dry, all these lots are dyed.

*To Dye Cotton Buff with Nitrate of Iron.*

You must have this work cleaned, and all ready for dyeing, on a peg, and six clean vessels that will hold six pails of water each; put six pails of warm water in a clean kettle or tub, and put in it one pint of nitrate of iron; handle the cottons in this iron liquor for ten minutes: wring it up out of this liquor, give it two clean waters, put it to drain, and make up six pails of clean warm water, in a clean vessel; put in it half a pound of ash, and handle it well in this for ten minutes; now get it up, and give it two clean waters (not the rinsing waters after the nitrate of iron, but two separate clean waters), and return it in the iron for ten minutes; get it up, rinse it, and return it in the ash for ten minutes; and rinse it out of this; stiffen it in flour starch, dry, finish it, and it is done.

REMARKS.—This is one of the easiest, as well as the fastest colors that is dyed; if the work is wanted very dark buff, it only requires to return it in the iron, rinse, ash, and rinse, without making any addition of drugs, until you make it as dark as you like; it will be a strong color.

*To Dye ten yards of Cotton Furniture Nankeen.*

Slack four pounds of lime, fresh as it comes from the kiln, then put it in a clean vessel, and put ten pails of clean water on it; then let it settle for a day or two, until it is transparent clean water, that you can see at the bottom of the tub, a white sediment; above this sediment is the lime-water, and that is what you want to make use of, and in taking the water off, you must

not disturb the bottom, or you will spoil the buffs. Now begin and dye your work by putting six pails of cold water in a clean vessel, and melt one pound of copperas in scalding water, in a stone jug; stir it well, and put it in the clean water, and handle your work well in this for ten minutes, giving it two clean waters after this, and put it on a clean peg to drain. Now have a clean vessel, and take six pails out of the ten you have of lime-water. You must not dip a vessel of any sort into the lime tub, but you must have a spigot, and draw off by that means six pails of it; the hole must be three pails above the bottom. Now hammer your spigot in, and put in more lime, fill it up, cover it over, and it is ready for use at any time you may want it, and this is what we call the lime tub. Now the lime-water is drawn off clear, handle your work in it for ten minutes, get it up, and rinse it in two clean waters, and handle it in the copperas again for ten minutes; get it up, rinse it, and lime it a second time; rinse it, and copperas it again; rinse it, give it a sour in clean water, and a water after the sour; starch it, dry, and finish it, and it is done.

REMARKS.—This is a simple and cheap way to dye cotton nankeen color—spirits will not discharge it, and the more it is washed in soap, or boiled in it, the stronger the color will be. If the cotton dyed this way is intended for trousers or dresses, I would recommend them to be well boiled off in soap, rinsed, and taken out of a weak starch, dry, and finish them, but there is no occasion for furniture lining to be done so.

*To Draw old Colors out of Cotton, and make them White with Oxy-muriate of Lime.*

If the cottons are a bad white, blue, green, buff, or any other color, intended for white, they must be cleaned well in soap and soda, and well boiled off in strong ash and soap, for this will let loose the old bodies, as well as clean them; and when they are done so, they are not so tried in the bleaching as they otherwise would be.

Now as blues, buffs, and greens, are the most difficult to make white, I will begin and bleach ten yards of each of the three colors. Clean out a tub that will hold twelve pails, and put four pounds of oxy-muriate of lime in the tub; have a clean stick, and put five pails of boiling water in the tub, well stirring it all the time you are putting the water in, to break the lumps. Now put five pails of cold water on this, and handle the three lots in the oxy-muriate as it is, for half an hour; now you will see them gradually, but not effectually, coming off. Perhaps they may want a few minutes longer in it; if so, keep them in it, they cannot hurt. Get them up on a peg, and put in the oxy-muriate half a teacupful of oil of vitriol; now put the work in directly, and handle it well for ten minutes; now take it and examine it to see if it is all of one clear white, which it is most likely to be; if not, give it a little more time, get it up, and rinse it well in three clean waters, sort the three lots, and for any one of them that is for white, make half a pound of the best starch for it; at once stiffen it, and hang it up to dry out of the way. The other two lots are ready to dye any color you want. If you have about twenty yards of cotton that is a bad white, and wants bleaching, put a pound of oxy-muriate in the tub that these came out of, and handle it in for ten minutes only, get it up, and put a tablespoonful of vitriol; put it back again, and give it ten minutes longer; get it up, rinse, and starch it for white; and if not, it is now clean for any other color.

*To Bleach small Articles of Cotton or Linen Fabric that are a bad White.*

These small things must be well cleaned and boiled off in soap only, and I will suppose that when they are all cleaned and boiled off, there is a pailful of them when wrung out. Earthenware pans I do not like, because they are glazed with lead, and that comes off when it is tried out of the common way; I like a wooden washing



tray that will hold five or six pails of water, for this purpose. If the tray will hold six pails of water, put in five; have a clean wash-hand basin, and mix up a pound of Barnes' oxy-muriate of lime into a thin paste, and put it through a thin gauze into the clean cold water in the washing tray, every bit of it must go in through the muslin; now handle in all these articles at once, keep handling them for ten minutes, and leave them well covered over for two hours; then give them a good handling for five minutes, and leave them in this until the morning; then get them up, throw this away, and give them three cold waters, and in the last water put in half an ounce of powder blue; handle well in this for twenty minutes, and they are ready for starching. These things ought to be always dried before they are starched, and when the starch is ready to take off the fire, put a quarter of an ounce of white wax candle in it, and stir it well; the iron will not stick with this caution.

*To Dye fifty yards of Cotton Furniture Pink.*

Cotton furniture linings for this color must be pink, white, or some very light color; they must be cleaned and well boiled off in soap and ash; if they are a pink they must be boiled off all the same. It is a mistake to think the old color is any service; it is better taken clean off. Some dyers think when they are boiling off these pinks they might as well put as much annatto in the boil as would make them flesh color, but that is a great mistake, they never can be made a good blue pink after they get the annatto, they will be always a fiery pink; besides they take so much more safflower to cover the annatto, and that makes it expensive, and you have a worse color for your pains; help of this sort is no good; safflower only is the best and cheapest.

To dye this forty yards of cotton pink, it will take two pounds of the best safflower, or three pounds of the common safflower, one pound of tartaric acid, or two

pounds of crude tartar, and one quartern of the best flour. The safflower being in soak for some time, and all the lumps broke in a kettle and ash, proceed and strip it of its color, as per instructions in page 65 ; and these cottons for pink are to take the place of the pink sheets in the extract of the safflower. Open the work and handle it well in for twenty minutes ; have a two-quart brown mug and melt the tartaric acid in it, with scalding water ; stir it well, and take up the pinks out of the safflower ; now put in one half pint of tartaric acid out of the mug, and handle the pinks in for ten minutes ; you must handle them in very quick this time and the next ; get them up and put in another half pint of acid, put them back and handle them in for ten minutes more ; get them up, and put in another half pint of acid, and handle them well for ten minutes, then get them up, give them a pint of acid, and put them back and handle them well, and they are dyed a very full pink ; you have now three half pints of tartaric acid left. Take them up out of the safflower liquor, and throw it away, and in the same tub rinse and starch them. You must rinse them in three separate clean cold waters ; and put a little common sour in each tub of water, it is not to taste by any means. When you give them the three separate cold waters, you put five pails of water in the tub, and give them one pint of the tartaric acid out of the brown mug ; handle them well in this, and wring them well out, and put them on a peg ; throw away this tartaric acid and water, but cleanse the sieve in it first ; strain the starch into the tub, put in the starch the half pint of tartaric acid that is left in the mug, stir it well, and begin to stiffen them ; if the starch is too hot you must cool it, it must be only warm ; wring them up, shake them, and hang them up where they will be dry by morning, and return them into the starch ; wring up, fold, hang up to dry, finish, and they are done.

*To Dye the above Rose Pink.*

This furniture lining must be well cleaned in soap, and boiled off in soap, ash, and annotto, at the same time, that is, in the same copper. Boil up four ounces of annotto in a saucepan that will hold two quarts of water, and four ounces of pearlash, for half an hour; strain this into your copper, and put the rose pinks in and boil them well for an hour, never leaving them all the time; they must be handled well also. Have a clean thin liquor of soap and soda, to put them in out of the copper, work them well in this thin liquor, and rinse them well in a strong sour, out of the thin liquor; give them full twenty minutes in this, well handling them all the time to regulate them; wring up out of this, and give them two cold waters, and now begin and dye them. In dyeing pale pinks, I did not use annotto, but I am obliged to use it in this pink to give it a peculiar plumpness, which materially assists the safflower. In dyeing pink, I allowed one pound of the best safflower for every twenty yards, or one pound of inferior for every sixteen yards; now you must have one pound for every ten yards of full rose pink or four pounds of safflower for the fifty yards. With good management in the dyeing, a splendid rose pink can be done on this cotton.

You will dye this now exactly in the same manner you dyed the pink; you must use more tartaric acid, because you will have to use more soda or ash in stripping the safflower. You must be cautious how you strip the safflower, a little too much would spoil all the safflower. I am very partial to having my cottons returned when dry in the starch, they gain every way by returning them, in cloth and color, and put a quarter of a pound of beeswax in the starch when it is made, stir it well until it entirely dissolves in the starch, and then leave it until you want to stiffen the work. The beeswax will make it glaze better, and if it is friction calendered, it will send the color down six shades darker, in fact you would not believe it to be the same color you sent to be



calendered, it will be so much improved by the beeswax in the starching.

### *Tartaric Acid.*

It has long been known that the casks in which certain wines are kept become incrustated with a hard substance, tinged with the coloring matter of the wine, which has been called argol; this when purified by solution and crystallization constitutes cream of tartar; from this salt, tartaric acid is procured. It consists in boiling the cream of tartar in water, and gradually adding chalk to the solution, until the effervescence ceases; the mixture is then set aside to allow a subsidence of the precipitate formed, which is afterwards washed and decomposed by sulphuric acid, when the tartaric acid thus liberated will assume a crystalline form. Tartaric acid is colorless, inodorous, very acid, and agreeable to the taste, so that it supplies the place of lemon juice for dyers in many important branches of their art.—From ‘Paris’s Chemistry,’ page 527.

### *Safflower.*

“Haselquist relates, in his voyage to Egypt, that when the flowers of safflower are gathered, they are squeezed between two stones, to express their juice, that they are afterwards washed in pit-well water, which in Egypt is naturally salt; that in coming out of the water they are pressed between the hands, and then spread out on mats on terraces; that they are covered during the day, to hinder the sun drying them too much, but that they are exposed to the dew during the night; that they are turned over from time to time, and that when they are found to be dried to the proper point, they are taken up, and prepared for the market. The flower of safflower has a fine flame color; it should be gathered only when it begins to fade; it is better when it has received rain; the seeds may be left to ripen after the blossom is

cropped.”—From “Butholet on Dyeing,” translated by Dr. Ure.

*To Dye Turkey Reds on Cotton.*

After the battle of Waterloo, a Frenchman of the name of Pamphillon came to London and introduced the dyeing of Turkey-reds on cotton; it created quite a sensation in London at the time. I have been told the Government gave him a premium for introducing it; and his Majesty, George III., went to Whitehall Gardens to see Mr. Pamphillon wash a piece of his own dyeing of Turkey-red in the river Thames. But he was not satisfied; he entered into speculations, quite foreign to Turkey-red dyeing, lost by them and died a poor man. Mr. Monteith succeeds him as a dyer of Turkey-reds, and has given his name to the color, just in the same manner as Americus snapped the name of the new world from Columbus by giving it his own. Shortly after my apprenticeship, I went to work as a journeyman for Mr. Duggan, of King street, Holborn, and there met with a fellow workman of the name of Baker; he and I worked some time together, and of course we were almost always talking of dyeing; he told me he worked for the Turkey-red Frenchman, as we dyers then called him, and the different processes he used; he then described them to me, which is as near as I can recollect, as follows.—Dyers of silk, woollen, and cotton, do not dye Turkey-reds—it is a branch in itself.

The cotton goods are cleaned regularly in soap, made from cocoa-nut or palm oil, and a copper in proportion to the quantity of work; from ten yards to a hundred yards is made to boil, and when it boils, the water is merely softened with pearlash, and then some of the palm oil soap put in to make a soap liquor; put the cottons in this, boil for half an hour, have a tub with a clean hot soap liquor in it, of palm or cocoa-nut oil soap; handle the work well in this, wring it out of it, and hang it up to dry. The next process is to beat up sheep and cow

dung, ash, and water together, until it is a liquid paste; now work all this through a sieve into a clean copper, and put a quarter of as much sweet oil to it, as you have dung and ash; mix these well together, with a fire under the copper, and keep stirring it with a stick all the time; you must see you have enough ash in it to make the whole mess into a soap-like stuff; there is double the quantity of water added to this liquor. The cotton is put in, and well handled, and left for the night; in the morning it has a palm oil soap liquor, wrung out well, and dried, and when dry, it is regularly cleaned in coconut oil soap, and dried again. Now you must give it a strong nut-gall liquor, and then a strong hot alum; give it an hour in the alum; and rinse it, and return it in the gall liquor again. Handle it an hour in this liquor, and get it up again, and give it an hour in the alum; wring it up well out of the alum, and dry it again. Now dye it clean in a copper, according to the bulk of the cottons, and for every three pails of water, put into the copper one pound of the best madder, and one quart of horse's, sheep's, pig's, or bullock's blood; get the copper on to a scald, and handle the work in, but it is not to boil in this liquor. Keep it in for an hour, get it up, and give it a good strong alum and hot water; give it half an hour in this liquor, take it up, rinse it in a couple of waters, return it, and boil it in the madder and blood copper, for half an hour; get it up; rinse, and dry it well, and when dry, clean it in very hot and strong soap liquors, rinse, and give them a weak starch for a finish. As these cottons are generally for ladies' dresses and handkerchiefs, they do not want strong starch, they must be got up soft. This color wears out with the cotton, not before; you may do as you like with it, it will not stir, nothing that we know of can move it, but oxymuriate of lime.

#### *To Dye Cotton Madder Red.*

Take a piece of white cotton as it comes from the loom, which is about twenty yards, some measure thirty.



It is now full of its own oil, but not bleached, neither do I want it bleached. Clean out a copper that will hold twelve pails of water; make it boil, and put in one pound of potash, melt this well before you put in the work; when it is melted put in the work and boil it for twenty minutes, then get it up and rinse it; put four pounds of the best sumach in the copper, and fill it up with boiling water; make the copper boil well for ten minutes; turn it over into a tub, and tell your man to scour out the copper, and fill it with clean water, and make it boil, while you handle the work well in the sumach for an hour; then take it up, and give it a scalding hot alum and sugar of lead, for half an hour; take it up and rinse it in two waters; put it back again in the sumach; keep it in this for half an hour, take it up, alum it again for twenty minutes, and take up and rinse it, and it is ready for dyeing. Clean out a copper that will hold twelve pails of water, put into it two pounds of madder, make it boil very gently for a minute or two, and open the door; put the work in the copper, and handle it well; shut the copper door and make it boil for half an hour gently; now take it up, give it a clean hot alum, and handle it well for twenty minutes; take it up, rinse it, and put it to drain. Now put one pound of fresh madder in the copper, return the work, and boil it for twenty minutes; take it up, rinse, starch, and dry it, and have it friction-calendered for a finish.

REMARKS.—These madder and Turkey-reds are considered fast colors, but oxy-muriate of lime discharges them like the fast blue. The handkerchiefs with the square spots in them are discharged by folding in squares, and putting in a hydraulic press; in the bottom of the press are square holes as you will see on the handkerchiefs. These new piece handkerchiefs are folded regularly by dozens up to the top of the press. On the top there is a corresponding pattern. The oxy-muriate of lime is forced by a pump into these squares at the top and comes out at the bottom; then rinsed with clean water. The press is unscrewed and they are well

rinsed in clean cold water. They can make corners, borders, and flowers, or any figures they like this way.

*To Clean and Re-dye thirty yards of Cotton Furniture Lining Crimson.*

Work of this description must be well cleaned, and all the old color boiled off in a copper of strong ash, and soap, for an hour; it must be well handled in the copper all the time it is boiling, and never left; if it is boiled off in the soap copper uneven it will show it all through the re-dyeing, and you must have a good strong copper stick for the purpose; when the hour is up, make a clean hot thin liquor of ash and soda to put them in out of the boil; punch them well in this, wring them up, and scour out a big kettle and make three lots of the work. Nearly fill the kettle with clean warm water and put a teacupful of common sour in it; now take one lot just as you wrung it out of the thin liquor, and spirit it well in this kettle; it must be kept even here as well as in the boil. Now make up two cold waters and get the work up on a peg to drain out of the spirits, and get another lot in the spirit. Tell your man to boil up in the little copper five pounds of sumach directly, and put a pound of soda in it, which must boil for a quarter of an hour, the man standing by it all the time, lest it should boil over; now go on with the spiriting, and the first lot you spirited throw into the rinsing water, and get up the second out of the spirits, and put a little more spirits in your kettle for the third lot, and tell your man to go on rinsing those you have spirited. Take up the last lot out of the spirits, and rinse them also in the two cold waters. Then throw the spirit away, and after it the two cold waters; make up a good warm water, and put the three lots into this one warm water, handle them well in it. Tell your man to turn over the sumach into a clean tub, and to boil one pail of peach-wood chips in a small copper that will hold five or six pails of water, twice, and to put half a pound of soda in

the first boil of the chips. Now you handle the work you took out of the hot water into the scalding hot sumach for one hour; they must not be left, get them up, and put your sumach into the sumach cistern, and put ten pails of boiling water in the tub, two pounds of alum, and half a pound of sugar of lead; handle your work well in this for an hour; get them up and give them a pint of muriate of tin, in this liquor; put them back and handle them well for twenty minutes; let them lie in this while you look to the peachwood and starch. Have two pounds of the best starch made in a pail and a half of boiling water in a small kettle; put it to swim in a copper of boiling water, and put into it one pailful of the second boil of the peachwood liquor, stir it well, and take it out of the copper to cool. See that the peachwood is turned over, the first and second boil in one liquor, and that it is cooling for you. Now go to the alum liquor, and get the work up and give it two cold waters, and put it to drain. See if you can bear your arm up to the elbows for a minute or two in the peachwood liquor; begin and dye your work by handling it well for half an hour in the peachwood liquor, and it is ready for starching, and, when it is starched and dried, returned in the same starch, folded, and finished by hand, tool or friction-calender.

REMARKS.—This thirty yards of cotton I took into the dye house dry, and never left it except for my dinner until I put it on the hooks to dry. My man of course was helping me all the time. One man cannot do much in a dye-house by himself; but I consider that two men working together will do more than three men working separately. Hence the advantage and saving in the concentration of labor.

*To Dye fifty yards of Cotton Lining Drab.*

This furniture lining must be well cleaned, boiled off in soap and soda, and spirited. If for a drab that is left to ourselves, we generally choose one from among the



drab patterns as a guide to go by; in this case we will scald (boil is better) three pounds of sumach and strain it into a tub with ten pails of cold water in it, and one pail of fustic liquor out of the boiled-up fustic cistern (see page 19), and handle it well in this for half an hour, take it up, and throw this away. Put ten pails of cold water in the tub, and melt one pound of copperas in a two-quart stone mug; stir it well and put one half of it in the clean water; stir this well, and handle your work well in it for twenty minutes; get it up and put the other half of the copperas into the tub; put the work back, and handle it well for twenty minutes. Now get it up and rinse it in two cold waters; put ten pails of clean cold water in a tub, and one pail of fustic; put half a pint of oil of vitriol into a brown mug, and a quart of cold water on it; stir it well, and put half a pint of the spirit out of the brown mug into it, and handle your work well in it for ten minutes; get it up and give it another half-pint of spirits; put the work back and give it ten minutes more. You must now compare it with your pattern, and if it is as you wish, get it up and rinse it in two clean waters. This will take a quartern of flour, and if wrung out of the rinsing waters pretty dry, will not want returning in the starch.

REMARKS.—This drab is neither a blue nor a red drab; if I want a slate drab I would give it no fustic; if I want a red drab, hot water would do.

#### *Another Method of Dyeing Cotton Drab.*

We will consider the work is all cleaned and ready, and for this fifty yards of furniture cotton lining I would boil up in five pails of clean water three pounds of sumach, and three pounds of ground fustic, boiled well for ten minutes, with half a pound of soda in it; when boiled enough, open the door and damp the fire. Have a clean tub and put ten pails of clean cold water in it; strain over the sumach and fustic into the tub, and make it taste with a little oil of vitriol mixed in water; melt

a pound of copperas in a stone mug, stir it well, and put one half of it in your tub. Handle your work for drab in for half an hour, take it up and give it a little more spirits and copperas; put it back in the liquor, and handle it well for ten minutes more. Now compare it with your pattern; if it is not dark enough, take it up and give in more copperas and more spirits; now put it back and handle it for twenty minutes; it should be to the pattern now, so get it up and rinse it well in four or five waters, starch it with a quartern of the best flour, and hang it up.

*Another Method of Dyeing the above.*

Boil a pailful of walnut rinds in five pails of water, three times, and strain it through a sieve each time. After the last boil throw the shells away, and clean out your copper for hot water, and to make starch. Handle the work in this walnut liquor for half an hour; have a tubful of clean water, and half a pound of copperas melted in it. Now handle these in for half an hour; get them up and rinse them well, and return them in the walnut-shell liquor for half an hour; take them up and rinse them well; stiffen them, glaze or calender them, and they are done. This is a very simple and cheap way of dyeing drabs.

*To Dye ten yards of Cotton Gray, and ten yards Slate.*

Put in a copper that will hold five pails of water, one pound of sumach, and one pound of ground logwood; boil these well for twenty minutes; open the copper door, damp the fire, and strain the liquor into a kettle or tub; tell your man to scour the copper, and have it to boil directly, and to make you a pound and a half of starch, while you go on dyeing. Put five pails of hot water to the logwood and sumach, in the tub, and handle in the slate color first for five minutes; then the gray, and handle both well for twenty minutes; put ten pails of

water in a tub, and melt one pound of copperas into it; stir it well, and take the work up that is in the logwood and sumach, and take the slate colors yourself, and your man the gray; handle the two lots in the saddening for twenty minutes; get them up, and rinse them, and return the slate lot into the logwood and sumach liquor a second time, and give them twenty minutes, and tell your man to starch his gray lot, and hang it up in a warm room to dry, and the gray is dyed. Now get up the slate out of the logwood and sumach, and sadden it again, rinse it, starch it, and hang it up to dry, and when dry, have both lots calendered.

REMARKS.—These two colors are done at the same time, and at the same cost; if only one is to be done, you must have the weight of drugs, and the same little copper, fire, and saddening; in fact, the expense would be the same, with the exception of half a pound less starch. They must be worked well in the starch.

*To Dye ten yards of Cotton Olive and ten yards of Corbeau.*

Boil in a copper that will hold five pails of water, two pounds of sumach, two pounds of ground fustic, and half a pound of ground logwood. Strain over the first and second boiling in one tub, handle the corbeau in first, and the olive next for twenty minutes. Get up, sadden as above, rinse, and return the two lots for twenty minutes; sadden again, and then rinse, and return for twenty minutes longer, and the olive is done. Put the corbeau backwards and forwards in the liquors three times, and it is done. Now rinse both in clean cold water, until all the dregs of the dye-stuff are rinsed out of the goods, then starch them, dry, and calender them, and they will be as good as new.



*To Dye ten yards of Cotton Furniture Lining Cinnamon, ten yards of Orange, ten yards Light Brown, and ten yards Rappee, at one time.*

Boil two pounds of annotto in four quarts of water, and one pound of soda; boil this well, and keep stirring it all the time, until it is a thin liquid; now put this aside, and clean out a copper that will hold five pails of water; fill it up, and make it boil; open the copper door, and put in one pound of pearlash, and all the annotto strained and rubbed through a sieve; put the sieve over the copper, after all the annotto is gone through it, and pass the new annotto liquor through the sieve that is over the copper, with a bowl, until the sieve is thoroughly freed from annotto; now put some of your melted mottled soap in it, and stir it up, and put the ten yards of cotton for orange in it first; boil this well for forty minutes; make up a clean warm thin soap liquor, with a very little ash in it; get two clean boiling-off sticks; take up the cottons on the sticks, and let the cotton drain into the copper before you put it into the thin liquor; handle your orange cottons in the thin liquor, and give them a strong sour out of it; rinse, and give them a little safflower to make them to the orange pattern; stiffen and hang them up, and they are done.

The next in this copper is cinnamon. Put the cottons in this copper, and boil them well for half an hour, and handle them well all the time; when the time is up, handle them into the thin liquor, and give them water; handle well for twenty minutes, then give them to your man to finish. The finishing process is done by giving them the scaldings of half a pound of sumach in five pails, to which is added a quarter of a pound of copperas in clean cold water, this occupies about twenty minutes; rinse them, and scald a pound of ground fustic, and pass this through a sieve into a tub with five pails of water, very hot; well handle them in this, and

rinse, starch, fold, and hang up, and the cinnamon cotton is done.

*The next is the Light Brown and Rappee.* Put half a pound of pearlash in your copper and fill up out of the thin liquor; handle the brown in the copper, next make it boil well in this for twenty minutes, and keep handling it all the time; if your work gets uneven through want of attention in the handling it will always show it when it is dry, and it will have to be dyed again. You must mind the customer only pays for one dyeing, so the dyer ought to be more careful in dyeing his work, and avoid having to dye it a second time, for while it is in his charge all loss has to be borne by the master. Now get your brown up out of your copper and put in the thin liquor; get it up, rinse it, and put it on a peg to drain.

The next ten yards is the rappee. Boil this in your annotto copper without any addition of drugs for half an hour, and get it up and put it in your thin liquor; handle it well in this, rinse it, and put it to drain. Now throw away your annotto liquor and scour it out; fill it up with clean water, put in it two pounds of ground fustic, two pounds of sumach, two pounds of redwood, and half a pound of soda, and boil it well for ten minutes. Now handle in your brown cotton and boil it well for half an hour; get it up, put six pails of clean cold water in a kettle, and melt one pound of copperas in a stone mug; put it in, and tell your man to handle the brown cotton in the copperas kettle, while you put the rappee in the copper, and boil it well for twenty minutes. Now tell your man to take the brown cotton out of the copperas, and rinse it in two clean cold waters; give him the cotton for rappee to sadden, while you give the brown cotton a second boiling in your brown copper for twenty minutes, when it is done. Now get up the rappee out of the saddening, rinse it, and boil it for twenty minutes; put one pound more of copperas in your copperas kettle, and handle the rappee cotton in it for twenty minutes; get it up and rinse it, boil it again,

for half an hour in the copper ; take it up and it is done. Well rinse this work before you stiffen it, for the ground dye-stuffs want a great deal of rinsing. I have used ground drugs here for the purpose of simplifying, so that any person that follows my directions will know the exact proportion of drugs they will require. By the measurement of the silk, woollen, and cotton fabrics they are going to dye, let it be much or little, they can easily see how much dye-stuff will be wanted for one yard.

*Another Method of Dyeing Cotton Brown.*

For ten yards of dark brown, and ten yards of light brown, put into the copper of five or six pails measure, three pounds of sumach ; boil it well for ten minutes ; turn it into a tub and well handle your cottons in it with a stick for an hour ; tell your man to clean out the copper and make starch, and when the time is up get your work up, and melt two pounds of copperas in a kettle, with six pails of clean cold water. Take the dark brown and handle it well in the copperas for twenty minutes, and get it up to cool, and handle in the light brown, while it is cooling, for twenty minutes also ; now get the light brown out of the saddening, and put the dark one in again for ten minutes longer ; get this up and put the other in the saddening again. Now put the saddening out of the way and rinse these in one cold water ; put three pails of boiling water on the sumach liquor that is left and which was used first, put the work in it, and handle it well ; punch and turn it in to clean as well as to darken it ; fold it up, put it on a peg to drain, and put ten pails of water in a tub, and three pounds of ground alum, and half a pound of sugar of lead ; your alum water must be as hot as your hands can bear it. Now put the two lots of brown cottons in this, and handle them well for half an hour ; leave them and scour out the little copper, put four pounds of peach-wood and four pounds of ground fustic into it, and make



it boil, then open the copper door. Take the light brown up out of the alum, rinse it in two ten pails of clean water, and then another ten pails; fold it up, put it on a horse to drain, and have two clean copper sticks and handle the work in the copper for twenty minutes; tell your man to get the dark brown out of the alum, and rinse it for you, and put it on the peg to drain. Take up the light brown out of the copper and cool it, tell your man to rinse and starch it, when it is done. Now begin dyeing the dark brown. Put this in the copper and boil it for twenty minutes; get it up, and sadden it; rinse and return it in the peach and fustic copper with a pound more of each drug in it. Boil it well in this for half an hour, and draw the fire from under the copper; take up your work, cool it, rinse it well, and stiffen these two lots in a pound and a half of the best starch and a quarter of a pound of beeswax, put in the lump into the starch directly it is made, and stir it until it is dissolved in the starch. When you are starching this sort of work you must be careful to work the starch well into it, as the white of the starch will show on it, unless by sheer force you draw the color out in order to stain the starch nearly the color of the work; when it is starched, it must be well shook out, nicely folded, and let lie by in a dry piece of blanket, or woollen cloth, for a couple of hours before you hang them up to dry in a warm room.

*To Dye a Drab Coburg Dress Brown, and Clean and Re-dye a Brown Coburg Dress.*

These two dresses must be cleaned, rinsed, spirited sharply in a common sour, and well rinsed out of the common sour, and dried. Great coats and other made up articles for dyeing brown, are always the better for cleaning, spiriting, and drying, for then the color gets into the heart of them.

The reader will excuse me from obviously going over the same ground again, and will perhaps think it suffi-

cient if I refer him to the last lot of browns for entire information how to dye this work brown.

Coburg cloth is an imitation of merino, and the principal thread is worsted, the other thread at the back of it is cotton, and that is the reason it has a place here; for when the worsted is dyed in the worsted way, the cotton dries white, and the worsted is brown; the white grinning through the brown thread makes it look very ugly. The way I am going to dye these browns now, is a way I have dyed them—cotton and worsted at one and the same time brown, and it is a very strong color. For these two dresses, all cleaned, spirited, and dry, have a copper that will hold ten pails of water, and boil first the two dresses in one pailful of oak sawdust, four pounds of ground fustic, and four pounds of redwood; boil these two dresses in this copper for half an hour; get them up, and put a drab coat for brown, and a pair of trousers in the copper, and boil these well for forty minutes. Now get up the coat and trousers, and put in your copper four pounds of sumach, put the dresses in the copper, and boil them well for half an hour, get them up to drain on a peg, and put in the coat and trousers for half an hour. Send your man to the copper to handle the coat and trousers, while you put a pound of copperas at the bottom of a large kettle, and fill it up with boiling water, now handle the drab coburg in this for ten minutes; take it up, open it out on the tenters to cool; put the other brown dress in the copperas, and give it ten minutes also; rinse these, and give them six pails of lime-water; wring them out of this, and put them back again three or four times through the copperas and lime-water. They are to be rinsed out of the copperas, and rinsed out of the lime before they go in the copperas. Now rinse them well, and put them to drain, and take the coat and trousers out of the copper; have your man to put in the two dresses, and boil them well for half an hour; now throw away the saddening out of the kettle, and all your rinsing waters and lime; rinse out the kettle, and put one pound of copperas in it, and fill it up

with boiling water and handle the brown coat and trousers in it for twenty minutes; now get them up, and cool them, rinse in two waters, and put them on the pegs to drain; take the two merinos out of the copper, and give them to your man to rinse, after they are cooled; these two merino dresses are dyed brown, cotton and worsted the same. They are two very pretty browns, one light, and one dark; they must be well rinsed; and melt a pound of size, such as you buy at the oil shops, in two pails of boiling water; strain it, and work them well in it to clean them, as well as to bind the color; they must have a clean cold water after the size; drain them, and hang them up to dry, and they are ready for finishing.

Now there is the coat and trousers boiling all this time in the copper; get them up, and sadden them a second time, rinse them, and put them back in the copper, boil them for half an hour, and they are done. If they are not dark enough sadden them again, rinse and return them in the copper and give them a good boil, and if then they are not dark enough repeat the saddening, rinsing, and boiling in the copper until they are black, if you like without any addition of dye-stuff; by no means put any copperas in the copper. Well rinse these, and scour them inside and out, over the scouring board with gall; well rinse the gall out of them, hang them up to dry, and they are done. When the coat and trousers are dry, grain them down with a hard brush and gall and water; they are not to be wet through, the brush is to be dipped in the gall, and the grain of the cloth well worked with the brush, and smoothed with the brush the way of the grain.

*Bleaching Powder.*—This is a chloride commonly called oxy-muriate of lime. On exposing a thin stratum of recently slackened lime in powder to chlorine, this gas is absorbed in large quantities; this chloride is formed in the state of a white powder, which destroys vegetable and animal matter, and is much used by dyers, and has been as a preventive for the cholera.

*Our Mordant Alum.*—Alum is the double sulphate of



alumina and potassa ; it crystallizes readily ; it is prepared in this country from a silicious clay, called alum slate, and in Italy from alum stone, which is produced in volcanic districts by the action of sulphurous acid vapors on the rocks. When this mineral is treated with a due quantity of sulphuric acid, it dissolves, and is converted into the crystallizable alum of commerce. Alum is extensively employed in the arts, particularly in dyeing, and lake making.

*Green Copperas.*—Green vitriol or copperas, as it is commonly called, is a sulphate of iron, and is prepared by the action of dilute sulphuric acid on metallic iron, or by the oxygenation of the native sulphuret of iron, or iron pyrites, by the action of air and moisture ; this salt is employed in the manufacture of fuming sulphuric acid, in the preparation of ink and Prussian blue, and in dyeing black and other colors in silk, cotton, and woollen fabrics.

*Blue Stone or Blue Vitriol.*—This compound is the sulphate of the black oxide of copper, and may be prepared by dissolving the oxide in dilute sulphuric acid, or by oxygenating the sulphuret by the action of heat and air.

*Verdigris.*—This compound is commonly used as a pigment, is an acetate of copper, and is prepared by covering copper plates with cloth soaked in pyroligneous acid.

*Sugar of Lead and Goulard's Extract.*—"Sugar of lead, also called acetate of lead, is prepared by dissolving either the carbonate or litharge in distilled vinegar. Goulard's extract is the subacetate of lead, and is prepared by boiling oxide of lead in excess, in dilute acetic acid."—"Hoblin's Manual of Chemistry."

### *To Dye twenty yards of Cotton Plum Color.*

This cotton must be well cleaned and boiled off in soap and soda, bleached with oxy-muriate of lime, and then made a pale blue in a blue vat. (See page 214).

When it comes out of the vat it must have a strong sour to clean it. Scald a pound of sumach, handle it in this for twenty minutes, and get up. Put five pails of water in a copper kettle, and melt one pound of alum, and four ounces of sugar of lead in a stone mug, and handle it well in this for half an hour. Get it up, rinse it in two clean cold waters, and give it two pailsful of peachwood liquor, and one bowl of logwood liquor in four pails of blood-warm water. Handle it in this for twenty minutes, get it up, and throw the liquor away. Put four pails of hot water, one pail of peachwood liquor, and one quart of logwood liquor in the kettle. Make this liquor as hot as you can bear your hands in it; handle the work well in it for twenty minutes; get it up, starch it, and hang it up to dry in a warm room. It will be a better color if returned in the starch when dry. When I intend to return any sort of cotton goods in the starch I never shift the starch out of the vessel, dry them quick and return them in it directly.

*Another Method of Dyeing the above.*

Scour out a kettle that will hold six pails of logwood liquor; handle your cotton well in this liquor for twenty minutes, and get it up so that it will drain in the liquor. Melt one pound of copperas, and a quarter of a pound of blue stone in a tub, with six pails of hot water in it. Handle the work well out of the logwood into this liquor for a quarter of an hour, get it up, rinse it well in three clean waters; handle it well again in the logwood for twenty minutes, and fold it up on a kettle peg, over the logwood. Put five pails of hot water, one pail of logwood liquor, and one quart of muriate of tin in the clean empty kettle. Handle the cotton in this liquor for half an hour, fold it up, and put in a tablespoonful of vitriol; put the work back, handle it well in this liquor for twenty minutes, fold it up, and throw the liquor away. Rinse the work in three clean cold waters, starch it, and dry it, and when dry, return it in the same starch; fold

it, and let it remain a few hours in the folds to regulate before hanging it up. This sort of color ought to be friction-calendered, as the glazing tool makes it wavy.

*Another Method of Dyeing the above.*

Clean out a copper that will hold six pails of water, and for these twenty yards of cotton, put in it three pounds of sumach, and boil it well. Turn it into a tub, handle the work in it for an hour, and get it up. Put six pails of scalding water, two pounds of alum, and half a pound of sugar of lead in a kettle, and handle the work in this for half an hour. Get it up, and put in the liquor one quart of muriate of tin. Work the cotton well in this for another half hour, get it up, and rinse it in three clean cold waters. Having a clean kettle or tub, put in it four pails of water, four pails of peachwood liquor, and one bowl of logwood liquor. Handle the work in this for half an hour, take it up, and throw away the liquor. Make up another of the same proportions of the logwood and peachwood liquors, and handle the work in it for another half hour, then get it up, and throw the liquor away. Put six pails of hot water, one pail of peachwood liquor, and a bowl of logwood liquor in the kettle, and handle the work in this for ten minutes. Get it up and starch it, and when dry return it in the starch, fold it, and when the starch is regulated in it, hang it up to dry in a warm room. It must be dried with care, and be friction-calendered for a finish.

*To Dye a new piece of Cotton, twenty-eight yards, Green, for Umbrellas.*

The cotton must be a fast green one, that will stand wind and weather to the last. It must be boiled in strong ash to take the grease and lime out of it, well rinsed, and put on a peg to drain. Begin and dye it blue first in the blue vat (see page 214), have the blue



vat frame on the floor of the dye-house, and have the cottons in a basket beside it. Begin by hooking the two selvages on the top and bottom of the frame. Having done this, drop the net into the vat and fasten it well, taking care it does not go within half a foot of the bottom. Having your man to help you, both of you lift it up and regularly and gently dip it down, as a man dips candles. When the top edge of the cotton is covered an inch it is low enough. Fasten it, and pass a long thin stick through the folds of the cotton, so that it may not stick together while in the vat. Give it twenty minutes in this; then both of you lift it up on the vat, put the stick between the folds, and blow and keep them asunder by all the means you can, until it cools down, which will be pretty soon. The reader, or the "unprofessional" reader, as the doctors say, must understand that when the cotton was taken out of the vat it was green; and if not well watched in the cooling, it will be uneven, and have to be bleached with oxy-muriate of lime, to take the color off, as it is fast. The cotton being regularly cooled down, put it back again in the vat if it should require it, and attend to it as at first. Get it up and cool it, and lift the frame with the work on it aside, while you take the net out, and rake it up, and cover it over. Now rinse it by taking it first off the hooks and giving it one clean cold water, then a sour to take the lime out of it, and a couple of rinsings after the spirits. Put ten pails of boiling-hot water and three pounds of ground alum in a tub, handle it well in this for ten minutes, and take it up; put half a pound of blue stone which has been previously melted in the tub; stir this up well, handle the cotton in it for ten minutes, get, it up, and put it back and leave it while you turn over the weld out of the copper it was boiling in, to dye it. Now the weld being cool and everything ready, fold the work up out of the alum, give it two clean cold waters, and well handle it in the weld liquor for half an hour. See if it is to your pattern; if it is take it up and rinse it; if not, melt some blue stone, throw away the

alum, put a dozen pails of water in the tub, and put the blue stone in it; handle the work in this liquor for half an hour, take it up, and rinse it in one water; put it through the weld liquor again for twenty minutes; take it up and rinse it; give it a water starch with half a pint of the killed blue in it, and hang it up to dry. This umbrella green must be finished without a gloss. It is one of the strongest colors that we dye; nothing but oxy-muriate will take it out.

*To Dye Cotton for Umbrellas a False Green without  
Dyeing them in the Cotton Blue Vat.*

For a piece of cotton about twenty-eight or thirty yards long, put in a copper that will hold six pails of water, three pounds of sumach, seven pounds of fustic, three pounds of logwood, and half a pound of soda. Make this boil well for twenty minutes, and strain it through a sieve into a tub. Fill the copper with clean water, make it boil well for twenty minutes, and strain it through the sieve into the tub with the other. Telling your man to scour out the copper, and get it on for hot water, put the work in the tub, and handle it in the boiling hot liquor for half an hour. Leaving it, put ten pails of hot water in a tub; and melting two pounds of copperas, and one pound of blue stone in a mug, put it in the clean water. Now fold up the work, handle it in this saddening for twenty minutes, get it up, and rinse in two clean waters; then put it back into the first liquor, handle it well in it for twenty minutes; take it up, and put it in the saddening for twenty minutes longer, and repeat the process, returning from one liquor to the other three or four times, until you have the work to the pattern. Sometimes it will do in a couple of wets; it is wonderful how easy all sorts of work go off sometimes, while at others, if you were to work your heart out, you cannot get on, or make any show. Now get up the work, rinse it well, and give it a weak

starch, with one pail of the first liquor in it; handle it well in this; dry it, and finish it.

REMARKS.—This color is not strong enough for umbrellas, but it is a cheap and expeditious one for all sorts of cotton goods. The process of dyeing materially thickens the cottons. and it also has this advantage—that however so much faded, a hot liquor of logwood and fustic will make it as good a color as it ever was.

*To Dye a new piece of Linen Dark Blue for Butchers' use, and a new piece of Cotton for Umbrellas.*

These two new pieces are about thirty yards each. Contrary to the usual practice in dyeing cottons a blue in the indigo vat, it is well raked up before we commence dyeing these dark blues; whereas in the light blues we carefully avoid it. Boil these well in ash, to open the pores of the cotton, and to take the grease and oil out of both, to make them soft for the dye vat. Get the frames out, and hook on the cotton first, and have your man to help you in with it. Let it drop, and attend to it while your man hooks on the piece of linen on another frame. Give each piece twenty minutes. Get up yours, and attend, you and your man, to the cooling of it. Then drop the linen in the vat, and attend to it, and so proceed during three separate wets of twenty minutes for each lot. Have three tubs of water all ready to rinse the work when it is vatted. Take the cotton first off the hooks, and rinse it; then the linen; give them three clean cold waters, fold them, and put them on a peg to drain. Make up a hot water, and melt a pound of blue stone in it; let the water be as hot as you can bear your hands in it; handle in first the piece of cotton for half an hour, and get it up. Get the linen into the blue stone liquor; rinse the cotton in two clean waters, give it two pails of logwood liquor in a good warm water, handle it in this for half an hour; fold it up, and put it on a peg to drain. Now take the linen out of the blue, give it one water, handle it in the log-



wood for ten minutes, and get it up to drain. Make up a logwood and hot water, the same as before, for it; handle it well in this for twenty minutes, take it up, and put it to drain on the peg. Give both a weak starch to bind the color. For a finish they must be calendered. They will be a real good strong blue, the fastest that can be made; the reason they have the logwood and blue stone is, that these liquors give them a purple shade, and make the blue look very rich. Those persons that are in the habit of buying these dark blues, will not buy them without the purple tinge.

*Redwood, for Dyeing Brown.*

Red sanders, the only one which is used in dyeing browns, is a solid, compact, heavy wood, which becomes brown by exposure to the air with iron. It is brought from the coast of Coromandel. When in fine powder, it gives to boiling water a fawn brown color, inclining to red. It dissolves ill by itself, but very well with the skin of the walnut, sumach, and nutgalls. Its color is solid, and usefully modifies that of the other matters. Vogler, having found that alcohol diluted with water dissolved the coloring matter of sanders better than water, employed this solution in dyeing samples of wool, cotton, and linen previously impregnated with a solution of tin. Washed and dried, they assumed a poppy color; a red alum caused them to acquire a fine scarlet color; the sulphate of copper, a light crimson; and the sulphate of iron, a deep violet color.

*Sumach, for Dyeing Black and Brown.*

“Sumach is cultivated abundantly in Spain, in Portugal, and in South of France, for the purposes of dyeing. Its shoots are every year cut to the root, and they are ground and dried for dyeing and tanning. Its infusion, which is a greenish hue, soon becomes brown by the action of the air. It approaches very near nut-

gall, and, with acetate of alumine, produces a solid and beautiful yellow for calico printers."—'Fourcroy.'

*The Walnut Shell, Rind, Root, and Bark.*

"The outer shell of the walnut, or the pulp which covers the kernel, is white and grows black in the air, as everybody knows. This blackness adheres to the fingers, and cannot be removed without difficulty. Sulphate of iron makes it black. It dissolves iron, and makes ink. Its coloring acts on silk, wool, and cotton. It is an excellent coloring matter. It affords very solid colors. It preserves silk, cotton, and wool, and requires no mordant. It is kept in tubs for years, the oldest is always used first. The bark and root of the walnut have the same properties. On trial by M. Berthold, they gave the same colors. In employing them, they may be put in a bag, like quercitron bark, and dyed with the work."—'Fourcroy's Chemistry,' vol. viii.

*To Dye a new piece of White Cotton Black.*

In new pieces of cotton there are always lime-grease, and other matters, which must be taken out before it can be properly dyed. In dyeing this new piece of cotton, thirty yards long, we must clean out the middle copper, and make it boil; put one pound of potash, previously well melted, in it; then put the work in, and boil it well for one hour. Get it up, rinse it, and dye it blue in the indigo blue vat, by putting it on the blue vat frame, and sinking it; give it twenty minutes in the vat; get it up, cool it, take it off the frame, and rinse it. Put three pounds of ground sumach, and three pounds of logwood in the copper, and boil it well; turn it over, and handle the work well in this liquor, for a quarter of an hour; while you are doing this, have three pounds of fustic boiled up. Folding up the work, melt one pound of copperas and eight ounces of blue stone in ten pails of hot water, and handle the work in it for twenty

minutes; get it up, rinse it in a couple of clean waters, and put it through your logwood and sumach again, and give it twenty minutes therein. Get it up, and sadden it again, throw away the logwood and sumach liquor, and strain the fustic into the same tub, and get the copper on for starch, and tell your man to make two pounds of the best starch directly. Take the work out of the copperas, rinse it, and handle it well in the hot fustic liquor for half an hour; work it well in this, as this is the liquor to jet it, as well as clean it from all the drugs. Get it up, and stiffen it with sago, fold it, hang it in a warm room to dry, and it is done.

*Another Method of Dyeing the above Black.*

Boil five pounds of sumach well for half an hour, turn it into a tub, and handle the work well in it for twenty minutes. Clean out the copper, fill it with clean water, and put in it five pounds of logwood, and five pounds of fustic. Give the cotton a good handling in this, and, putting them under the liquor, leave them for the night. In the morning begin dyeing. First take the cotton out of the sumach; melt three pounds of copperas in a small kettle, with three pails of boiling water; put eight pails of water in a tub, and pour the copperas into it; and handle the cotton out of the sumach in this liquor for half an hour. Take it up, cool it, rinse it in one water, fold it and drain. See now that your man is boiling the logwood and fustic. Turn nine pails of lime-water into a tub, handle the cotton out of the copperas in it for a quarter of an hour, and fold it up. Do not waste this liquor, as it will be wanted again. Rinse the cotton in one water, handle it in the copperas again for twenty minutes. Get it up, and put it through the lime for twenty minutes; then get it up, and put it through the copperas again. Get it up out of the copperas, and cool it, throwing away all the liquors. Give it two clean cold waters, put it in the logwood and fustic which your man has strained into a tub, and handle it in this



for half an hour; then give it a second boil of the logwood and fustic, handle it in this liquor for twenty minutes, and give it a couple of cold waters out of it; put it to drain, stiffen it with sago boiled and stained, hang it in a room to dry, and it is done.

*To Dye ten yards of Cotton Velvet Black.*

Boil three pounds of sumach for twenty minutes, turn it into a tub, handle the velvet in, and let it stop in this for a night. Put in a six-pail copper two pounds of logwood and two pounds of fustic; boil this twice or a first and a second liquor—that is, after the work is saddened and limed. You must give it the first boil, and throw the liquor away; then give it the second boil, and it is done. Give it two cold waters. It must have no stiffening, as that clots the pile. It will not do to lay it on a peg, it must be hung up by the selvage directly. When dry it must be well brushed right and wrong side. That is all the finishing cotton velvets can receive. Some people give them an oil rubber, but that ought not to be done if it can be avoided. Silk velvets are dyed and dressed in a very different way from these.

*To Clean and Re-dye Black Cotton Velvet.*

Weigh the velvet, and boil in a copper as much logwood chips as the black cotton velvet weighs; it is of no consequence if it is made up—it must have the same weight. Put a tenth of the weight of soda in with the chips. Boil the logwood three times, so as to have plenty of float. When all is boiled and turned over, handle the velvet well in for half an hour, and put one tenth of the weight of copperas into the logwood liquor out of which you took the velvets. Stir this up well, put the velvet back into it, and handle it well for half an hour. Get it up to cool, and throw away the liquor you took it out of; rinse it and hang it up to drain. Scour it with gall and water over a board with a soft

brush, well rinse it, and dry it; when dry, brush it carefully, and it is done.

*To Dye Silk, Cotton, and Worsted Stockings, Black.*

There is a very extensive trade carried on in all the principal towns of the three kingdoms in stocking dyeing. In London, Dublin, and Edinburgh, silk stocking dyeing is a branch in itself. The dyer who dyes silk stockings dyes nothing else; the dyer who dyes cotton stockings also dyes nothing else; and the dyer who dyes worsted stockings also confines himself to that particular branch. The reason simply is, that in dyeing, dressing, and pressing silk, cotton, and worsted stockings, the dye-house must be adapted in a variety of ways for such a purpose; and then the drying, the dressing, the leg-boards, and pressing the stockings are so different to anything else in the dyeing trade, that it becomes of necessity a branch in itself. The dyers in the country towns are obliged to dye every kind of work that is brought to them, and to finish it themselves; and, being thrown on their own resources, it makes them very good general workmen. When they come to London, they ask the London dyer for employment in any branch of the business; the dyer who is brought up in a large town asks for employment in that branch of the trade he was apprenticed to learn—either silk, cotton, woollen, or garment dyeing. The garment, bed, and window furniture dyeing and cleaning, comprehending articles composed of silk, cotton, and wool. The garment dyers are obliged, by their calling, to know how to dye all things sent to them.

I will begin to dye the silk stockings. For every pound weight of silk stockings put in the copper one pound of bruised walnuts, one pound of fustic, and one pound of logwood chips, and one ounce of ash, and boil these well for two hours. Then damp the copper fire, open the copper door, and turn the chips and liquor into an empty copper, tub, or kettle, that is clean and

dry; rinse out the copper, and take care there are no chips in it. Put two sticks across the copper and a sieve on them, and put the liquor back again into the copper through the sieve. Now handle the stockings in this for one hour, and let them lie in the liquor while you put hot water in a kettle and scald two ounces of copperas, and one ounce of blue stone in a mug, and put it in the hot water in the kettle. Take up the stockings to drain, then put them in the saddening, and handle them well in this for twenty minutes. While saddening the stockings, stir up the fire so as to make the copper scalding hot. Then take up the stockings, and rinse them well in three clean waters. Open the copper door, damp the fire, put the stockings back again into the copper, and handle them well in this for another hour. Get them up and put them back again in the saddening; handle them in it, and let them lie in it while you beat the galls and logwood back again into the copper, and make them boil well, to dye another lot of stockings a different way. Now get the stockings out of the saddening, rinse them well in four or five cold waters, put to drain, and clean them in sago well boiled and strained; rinse, and dry in a hot room; shift them, and let the part that was previously uppermost hang down.

*Another Method of Dyeing Silk Stockings Black.*

The liquor in the copper is now only half the strength it was originally, yet, notwithstanding, you are not to have any less weight of stockings than at first going off. Boil well for an hour, and turn it over and strain it back as you did before; then handle the stockings in the copper well for half an hour. Make up a saddening for them as you did before; and get them up and sadden for twenty minutes; rinse, return in the copper, and sadden them again. Now throw away this liquor, clean out the copper, fill it with clean cold water, get it on to a boil, and put into it half a pound of logwood, and half a pound of fustic, for every pound weight of silk stock-



ings you had when they were dry. Make the copper boil well for an hour, and put a little soda or ash in it; damp the fire, and turn the copper into kettles swimming in cold water to cool it down; rinse out the copper, and turn these liquors in the kettles back into it, if they are nearly cold, through the sieve. Make this copper a good strong soap liquor with the amalgamated soft soap and oil. The silk stockings have been allowed to remain in the saddening all this time; get them up, rinse them in a couple of clean cold waters, wring them, and put them into the cold logwood fustic and soap copper; handle them well in this until it becomes gradually too hot for your hands; get them up, clean them in two nice warm soap liquors, and take them out of a thin liquor; separate them, hang them up to dry, and after a time turn them upside down in the drying room as before.

*Another Method of Dyeing the above.*

Put the stockings in a preparation of nitrid of iron—one teaspoonful of oil of vitriol, and half a pint of nitrid of iron, for every pail of cold water. Let them lie in this preparation forty-eight hours, turning them now and then all the time; get them up, and dye them in fusic, logwood, and amalgamated soft soap: getting them into the copper cold, and attending to them until they are dyed; then give them a gentle cleaning in soap; wring them out of a thin soap liquor, separate them, and dry them.

REMARKS.—Silk stockings, when they are taken into the dressing-room, out of the drying-room, are examined; and if they will do, they are well shaken, and put on leg boards suited to their size, by pairs, the right side inwards, and brushed with a brush called the stocking brush, which has had a little neatsfoot oil gently put on it. Each stocking is then taken off the board, and turned right side out, stretched well up, and tacked by the top to the two edges of the leg-board, and then

brushed with a soft brush to brighten the silk and raise the floss. So the dressers go on until they have two or three dozen prepared. They then set a lot of shavings on fire, in a place made for the purpose, and pass every one of the stockings, both sides, through the blaze of the shavings. In some places this is done with gas, and is called singeing. After this is done, they take them to a board, put them one by one on it, and rub oil into them sparingly. Then they fold them into pairs, and give them to a woman to run a thread of white floss silk through them, and fold them, putting a weight on them, and they are ready for delivery to the customers.

Silk, cotton, and worsted stockings for black are always woven from the raw material first, for this reason, that in the weaving it would be impossible to prevent threads and floss of white, blue, and other colors, that are always flying about in a factory, mixing with it.

### *To Dye Worsted Stockings Black.*

To dye worsted stockings black is not such a particular process as dyeing silk stockings. There are many ways of doing it, but I shall confine myself to two that are most in use in London. The mode is much the same throughout England and Ireland. Put the stockings in one scale, and the logwood in another, weight for weight. Put the logwood in the copper, and boil it well for five minutes; put the stockings in, and boil them for one hour; they must be moved about with a stick, and kept well under the liquor. Get them up, and put in the copper one-sixth the weight of copperas, and boil them in this for twenty minutes. Get them up and cool them, and when perfectly cold, return them, and boil them well for twenty minutes more. Get them up, and put them to cool. Throw away the liquor, scour out the copper, and fill it up with clean water. Rinse the stockings well in three or four clean waters; then melt two ounces of common size in two quarts of scalding water, for every pair of stockings. Stir the size

well, strain it into a vessel, and put the stockings in it, scalding hot, as it is, five or ten minutes, well working them all the time they are in to cleanse them. Now get them up, rinse in a couple of cold waters, and they are done.

*Another Method of Dyeing the above.*

Weigh the stockings, and put in the copper the same weight of logwood, and the same weight of oak sawdust—that is, two of dye-stuff to one of wool. Boil these in the copper five minutes, then put in the stockings, and boil them for one hour, stirring them with a stick all the time. Get them up, and put in a fourth of the weight of copperas. Put them back, and boil them for half an hour; do not leave them; when the half hour has expired, get them up, hang them to cool, and rinse them. Size, and rinse, and they are done.

*To Dye Cotton Stockings Black.*

Boil up the same weight of sumach as you have stockings, for twenty minutes; turn it all over into a tub, handle the stockings in it, and leave them until next morning. Put in the copper the same weight of logwood, boil it up well, and turn it into a tub through a sieve; clean out the copper, and put half the complement of fustic in it, and make it boil. Now take the stockings out of the sumach, and melt a fourth of the weight of copperas, and an eighth of the weight of blue stone in warm water, and handle them well in this for twenty minutes. When the time is up, take them out and cool them, and give them a lime-water, and put them backwards and forwards a couple of times. Rinse, and give them the logwood, and then the fustic for a finish; rinse, put them to drain, and they are done.

Worsted and cotton stockings are taken up to the drying-room, where they are partly dried, and then put on the board and legged in the same manner as the silk



stockings. When all are legged, they are hung to dry in a hot or cold room. I used to place them, hanging by the string that is in the board, in the sun. When dry they are brushed, rubbed like the silk stockings, and hot-pressed for a finish.

I must again impress on the dyer the necessity of buying the drugs at a dyers' driesalters, and nowhere else. There are not many wholesale and retail driesalters in London. There is one in Longacre, two in Thames street (one near Southwark bridge, and the other near London bridge), one in Shoreditch; and one in Brick lane, where they will sell you from an ounce to a ton of dye-stuff that may be depended on. I have an interest in sending any one that will work according to my instructions to the places where he can have good dye-stuff; for I have been particular in giving the weight and measurement necessary in producing a color; and see how annoying it would be to me to have rubbishing dye-stuff put in the copper where I am directing how to work the best dye-stuff! Besides, you will get the best at a dyers' driesalters, for the same price you will pay for rubbish anywhere else.

### *Another Method of Dyeing Cotton Stockings.*

Sumach them well for a night, hot sadden, cool, rinse, and return in the sumach for thirty minutes; take up, and put them through the copperas again; then rinse and dye them in three parts logwood liquor and one part fustic—two liquors. Wring them out of this, and get the soap fat in them, with Field's soap, and wring them up nearly dry out of the soap. When nearly dry, board them and press them, and they are done. A centrifugal wringing machine will dry them dry. A wringing machine is best for stockings. If they are not wrung well out of the soap, they will be two colors.

## CHAPTER IV.

THE ART OF CLEANING AND DYEING  
FEATHERS.*Feathers in their Natural State.*

THE feather is a round, horny, transparent tube, filled with musculous marrow. The feathers colored with the richest hues, and forming one of the most beautiful ornaments of animated nature, are to the chemist among the problems the most difficult. It is not only in the origin of these colors, so multiplied and diversified—the cause of their variation, existing even in the continuity of the same feathers—that the difficulty of this problem consists. It exists with still greater force in the difference of the colors which follow, and especially in that which depends on the age of the birds and the seasons which cause them to vary. And at what period will chemistry be so advanced as to be able to determine with precision the coloring matter and its formation? Boiling water softens and at last destroys it; the acids and the alkalies dissolve it. Many of the coloring matters attach themselves easily and adhere strongly to the feathers, particularly to the plumes. It is known for ages that an ingenious art exists in dyeing feathers and giving them all possible tinges.—From ‘Fourcroy’s Chemistry,’ vol. x.

*To Dye Feathers three different Blues in one liquor.*

Feathers to be dyed pale blue must be white or pale blue. The first process is cleaning in warm soap and water, and well rinsing out of the soap. Scald half a teacupful of neat Saxon blue (see page 60) in a long new pickle jar, that will hold four quarts of water. Put your blue, neat as it is, into the clean empty jar, and pour

two quarts of scalding water very slowly (or it will run over the jar with the heat of the scalding water) on the neat spirits. While you are pouring in the water, keep stirring with a clean tobacco pipe. Put about eighteen inches square of clean old blanket (one of the woollen corners is the best, not the old worn-out middle, for there must be strength and substance in it) to suck up the color. Now put your blanket in the jar and put it on a shelf in a dry place until the morning. Then take it up and rinse it in five or six pails of clean cold water. Put two quarts of boiling water and an ounce of soda in the jar first, well cleaned out, empty, and dry before you use it the second time. Now put in the piece of blanket and draw the blue off. If it does not come off as fast as you could wish, put the jar to swim in a boiling copper of hot water until it is all off, which you can tell when the blanket is a green drab; take the blanket out directly and put it to drain into the jar; while it is draining melt four ounces of tartaric acid and put in the jar; wring the blanket into the jar, hang it up to dry, and commence dyeing the pale blues.

Put into a vessel eight quarts of spring water from a pump (not soft water), and melt two ounces of alum into it, and half a pint of the blanket blue. When this is done, put in the three lots of feathers and lift your vessel into the hot water copper to swim; and when it gets above blood heat take it out, and see how the pale blue feathers are progressing. By this time, without any more color, you have one lot a pale pearly blue; take it out and lay it full length on a clean cotton sheet; throw an end of the sheet over it, and press your hand as gently on it as you would blotting paper on a book, and shift it to a dry place until you have nearly dried it; then take it to the fire place, and put before a nice gentle fire, well shaking it. Before the feathers are thoroughly dry, which will be in five or six minutes, have a very smooth paper, horn, or steel knife, and curl them before the fire, and they are done. Now take up the two feathers and put in another. Put in it a pint more of blanket



blue, lift it into the copper to swim; get it dyed twice, as full as the first, and take it out of the copper; sheet, dry, and curl it in the same way as the last. Now take up the other and give it another half pint of blue, and dye it exactly in the same manner as the other two lots.

This is the best way of dyeing feathers pale blue. When they are dyed this way, the color is firm; the alum makes them waterproof, so the air has no effect on them. When pale blues are dyed in spirits, like the paste blue, the air comes into the downy part of the feather and kills the spirit, and the blue goes off directly; not so when done this way. No damp or air can get into the feather although worn in the open air, and the consequence is that the blue lasts until the feather is worn out.

*Another Method of Dyeing Feathers Pale Blue.*

Put one pail of warm water, one ounce of tartaric acid, and two ounces of paste blue in a clean vessel. Let the feather remain in this until it is dyed the pale blue you require. If you have more feathers for full pale blue, add to the liquor in the same way as you did in the first method of dyeing pale blue, until they are all done; and when all are done, dry, and curl them in the same manner as the first.

*To Dye Feathers Dark Mazarine Blue.*

Clean those feathers well with soap and warm water, and make them a full peach color, with the blue vat (see page 214) on the top of the peach body. Let them lie in this cold indigo vat for two or three hours, suspended from a string, and separated five or six inches apart. They are to be taken up every half hour, cooled, and returned in the cold vat until you have them as dark as you please. Every time you take them out makes them three or four shades darker. When they are dark enough get them out, rinse, clean them in a warm soap, and take them out of a thin soap liquor, with a little

cudbear or orchil in it. Dry them at once before a fire, shake them well, curl them, and they are done.

*To make a small Indigo Blue Vat that will Dye Feathers and small Articles of Silk, Woollen, and Cotton, Dark Blue.*

Have a good strong nine-gallon cask, and put into it eight gallons of chamberlye. Have a four-quart pickle jar and put one pound of ground indigo into it, and on the indigo put three pints of the best pickling vinegar. Put a saucepan on the fire and put the jar in it, and then fill the saucepan with clean cold water, the jar being in the saucepan all the time. Now make this boil well for two hours, and keep stirring the indigo well all the time. Get it up and put it on the hob for three or four days, and then pour it into the chamberlye in the firkin; rake this up twice a day for a month, and it is fit for use for any of the above purposes. It must be covered over with a wooden lid, or it will spoil. This vat will last a long time if it is raked once a month and helped with a little indigo and lye now and then; it will last for years if kept covered.

*To Dye Feathers Dark Blue with Nitrate of Iron.*

Put clean water in a vessel, make it taste with a little tartaric acid—it must only barely taste—and put nitrate of iron into it; stir it up, and put the feathers in it. Now clean out a vessel, and put clean cold water in it; melt prussiate in a mug, and put it in the water; take the feathers out of the nitrate of iron, rinse them, and put them in the prussiate; you must repeat this, from one liquor to the other, six or seven times before you have your color, always rinsing out of the iron before you put the feathers in the prussiate. When you have your color rinse in a couple of waters, and they are done.

The bone of the feathers being horny and glossy,

that must be particularly attended to in the cleaning, for that is the most difficult thing of all in feather dyeing. The best way of getting over this difficulty is to get the oil out of the surface of the feather, and make the surface of the quill as porous as possible without hurting the enamel. Before it is put in the dye, rub a piece of ammonia into the horny surface; this will soften the horn without injuring the feather. It must not go on the down of the feather, and must be rinsed off before going in the dye.

As I intend to give weight and measure for all the drugs used in dyeing feathers, and as some require heat and some not, I have selected eight quart pickling-jars for the purpose of making the compound and non-compound dyes for the different colors. The reason why I select pickling-jars is because they are clean, and if the dye stuff wants heating they are handy to lift in and out of the copper; when they have been used, it is easy to put them by, and the drugs remaining in them are nice and clean when wanted again. Large vessels are not required for feathers, and dyers in the country and the colonies would find the jars very handy. This is a plan that an old feather dyer in London successfully carried out for a number of years.

### *To Dye Feathers French Blue.*

We will suppose for the future that all the feathers are clean and ready for dyeing, and we will never put more than six quarts of water in a jar. Now put in this jar one pint of preparation spirits for prussian blues, and put the feather in this; melt four ounces of red prussiate in a stone mug, and stir it well; put clean cold water into a clean jar, and put the jar to swim in a hot water copper. Get the feather out of the preparation, rinse it in two cold waters, and put it in the jar with the prussiate in it, which is swimming in the copper; do not leave it, but keep moving it about with your hand; when the jar gets warm, get it out, take the



feather out, and put it in the prussiate; and so it must be passed from one liquor to the other, five or six times, until it is done. When it is done, rinse, and spirit it with a little tartaric acid—very little indeed.

REMARKS.—This is the most difficult color the feather dyer has to do. A friend of mine, a feather dyer, was complaining to me how difficult it was to dye French blues on feathers. I recommended him to try “Maltby’s Preparation for French Blues,” and gave him some; and he has been using it every week these two years to his satisfaction. It is with “Maltby’s Preparation” I have dyed this feather French blue, and a very good blue it makes on feathers. Maltby is a dyer’s manufacturing chemist, his residence is at Assembly row, Mile-end road.

### *To Dye Feathers Green.*

For your jar boil up two pounds of ground ebony in six quarts of water, and strain it over; boil it again, and strain it over; put two ounces of ground alum and one ounce of tartaric acid in; put in the feathers, and after a short time get them up, and add a little Saxon or paste blue to the liquor; handle in the feathers, and give them time to drain on the blue; and when the pale greens are done, rinse in two clean waters with a little sour in them to bind the color, and dry in a warm room. Add a little more blue to the liquor, and dye the next darkest green; and so add yellow and blue to the green liquor until all the greens are dyed. Turmeric and blue make any sort of greens on feathers. If they are for dark greens, they must have a warm liquor—not too warm, or it will injure them.

### *To Dye Feathers Pink.*

Clean in warm soap, and dye them with extract of safflower (see page 63) or pink saucers. They must be put in the extract, or the pink saucer in clean warm water,

and allowed time to suck up the extract; then add a little tartaric acid to the safflower, put them in, give them a little time, get the mout of a clean water with a little tartaric acid in it, and when dried and curled they are done.

Feathers for rose or full pink must get the pink saucer or safflower in clean water by itself, and the tartaric acid by itself. The feather must be put in the safflower first, and the liquor heated to a hand heat; and out of this it must be put in cold water, with tartaric acid in it, to taste sharply; then a clean cold water out of the acid, and returned in the flower; and so go on, from one liquor to another, until you make the feathers any pink you like. from the lightest to the darkest rose pink. You must finish out of the tartaric acid, and dry in a warm room; and when dry, curl them and they are finished.

Feathers for blue pink must have a slight tinge of orchil first—about the tinge of a French white.

Feathers for rose and fiery pink must have a little annotto worked in the soap when cleaning, and then be rinsed and dyed with extract of safflower or pink saucers.

### *To Dye Feathers Orange, Ponco, and Scarlet.*

Buy at Barnes's, in Long-acre, one pound of annotto, and a quarter of a pound of pearlash; boil them together in one gallon of clean water, until the annotto is dissolved. Take it off the fire, and let it cool until you can bear your hand in it. Begin and dye all the feathers by giving them enough time in it; and when the orange is full enough of annotto, get it out (leaving the other two in the dye), and clean it from the dye in clean blood-warm soap and water; rinse it, give it a weak acid for a finish, and when dried and curled it is done.

The ponco and scarlet are next, and must be cleaned and spirited like the orange color. These two colors must have extract of safflower, or pink saucers on the top of the annotto, to make them ponco or scarlet. For the method of doing this, I must refer my readers to the di-

rections in the preceding page for dyeing rose. Ponco being a bastard scarlet must not have the best of the dyé-stuff—certainly not; it must be second to the scarlet as a matter of course. The feathers for these colors are not cleaned before they get the annotto; they are cleaned afterwards, before they are reddened with the safflower and acid.

The annotto the feathers were dyed in, is to be saved, as they have not weakened the annotto more than about two ounces in the sixteen ounces. It must be covered over in a jar and kept very clean, and when wanted it must be heated up again, and half an ounce of pearlash and one ounce of soap put in it every time it is used. It can be helped with fresh annotto each time, but I do not like that way, I prefer to work it down with buff, leghorn, and salmon colors. Annotto is cheap, and the fresher it is the better are the colors, and I always make it a point to produce the best colors I can on my own work, never minding the expense.

### *To Dye Feathers Black.*

Put in your earthen jar, as before described, eight quarts of water, and one quart of nitrate of iron; clean the feathers, and put them in this twelve hours. Get them out, rinse in three clean cold waters, and dye them with three quarts of logwood liquor, and three quarts of fustic liquor. Make a thin soap liquor with the prepared soft soap and oil (see page 82). Now put the jar to swim in a boiling-water copper, and the feathers in the jar, and make the dye-stuff as hot as you can bear your hands in it, the feathers being in the jar all the time. When they have sucked the logwood and fustic, take them up and give them a quarter of an ounce of turmeric in the same liquor, and a quarter of an hour more time. Get them up and clean them in three blood-warm soap liquors, and dry out of soap; when dry, jet them with a little neats-foot oil, rubbed on the hands; then curl them, and they are done.



*Another Method of Dyeing the above.*

Prepare in your jar one pound of green copperas, a quarter of a pound of bluestone, and a quarter of a pound of argol, all well melted, and put in eight quarts of clean cold water. Put the feathers in this for two or three days, stirring them gently twice a day. Get them out and dye them with four quarts of strong logwood liquor, and four quarts of fustic liquor in a jar. Rinse them, and put them in this liquor, and let them lie in it until they are black; then rinse in clean cold water; and when dry, jet them with a little oil on the hands; then curl them, and they are finished.

*To Dye Feathers Marone, Ruby, Claret, Brown, and Rappee.*

To eight quarts of water put one pound of the best cudbear, well mixed; then put in the feathers for marone, ruby, and claret; make the dye liquor as hot as you can bear your hands in it. Get them up, and the ruby is dyed; put a quarter of a pound of turmeric in the liquor, and put the marone and claret back; heat it up again, and when hot enough, take them out, and the marone is dyed. Melt a quarter of a pound of copperas in a pail of warm water, and put the claret in it for five minutes; rinse it out of the copperas, put it back in the dye-stuff, and re-heat it for ten minutes; then take it up, rinse it, and it is done. The brown feathers are now to follow in the dye-stuff that is left. They will want to be saddened and returned three or four times before you can get them the color you require. Now when dyed, they require good rinsing. When dry, curl them, and they are done.

REMARKS.—This is the simplest and best way of dyeing feathers the above colors.

*To Dye Feathers Crimson, Ruby, Marone, and Claret.*

Clean in soap and rinse. Melt one pound of alum in your jar with hot water. Put eight quarts of cold water in your jar; put the melted alum in it, and then the feathers, and let them lie in it a couple of days; boil up, in six quarts of water, one pound of Brazil, strain it off, and boil it again in six more quarts of water, and strain it off. You must boil it a third time in like manner. and throw away the Brazil grounds: they are no good. Begin and dye the feathers the crimson first, by taking it out of the alum and rinsing it in one cold water. Put six quarts of pure Brazil liquor in the jar, and put the crimson feathers in it and dye it; and when it is the crimson you require, take it out, rinse in one cold water, dry in a warm room, curl it, and it is done.

The ruby must be done in like manner with half a pint of blue orchil in the Brazil liquor, but it must have a strong heat to get up the orchil—as hot as your hands will bear it will do.

The marone and claret must have a quarter of a pound of turmeric in the Brazil and orchil liquor, and more of the Brazil liquor: give these two colors a quarter of an hour in the dye, and the marone is dyed.

Melt two ounces of copperas in a couple of quarts of water, and sadden the claret-color feathers in it; rinse them and return in the dye-stuff for ten minutes; get them up, rinse, dry, curl, and they are done.

REMARKS.—This is a roundabout way of dyeing these colors, but not half so bad as many other ways I have seen. There are none so good as the above two ways.

*To Dye Feathers Buff, Salmon, Primrose and Leghorn.*

Clean and dye the buff and salmon with half a pint of the annotto liquor (that was left after dyeing the scarlet) in a jar with six quarts of clean water, and one ounce of soda in it. Heat it up to hand-heat with the feathers in it. Take them out and rinse. Give the

salmon color a little acid in the rinsing, to redden the annotto ; and when dried and curled, it is done. The buff is to be cleaned in soap out of the dye, and rinsed in clean water, and it is done when dry and curled. For primrose and leghorn, boil half a pound of ground ebony in two quarts of clean water for ten minutes, and strain it into four quarts of clean cold water, in a pan or jar ; put the leghorn and primrose feathers in it, and if they don't draw on the color as quick as you wish, give them heat until they are dyed as full as you want them. Finish them by rinsing with a little sour in the rinsing waters, dry and curl, and they are done.

*To Dye Feathers Puce and Violet.*

Clean in soap, and put four quarts of clean water in a jar, and melt a quarter of a pound of alum in it ; put the feathers in this for twelve hours, then get them out and rinse them in a cold water, and dye the puce with one quart of logwood liquor, and one quart of peachwood to four quarts of water, got on to hand-heat in a jar ; when they are full enough in this liquor, take them out, throw the liquor away, and put four quarts of clean water in the jar, adding half a pint of logwood and half a pint of peachwood liquors. Put the puce color feathers in this, and heat it up gently to hand-heat, and they are dyed puce color. This last liquor is what we call giving it a thin liquor of dye-stuff ; it cleanses and improves the color. Some dyers work a cupful of blue orchil in this second liquor ; it improves the color very much. These feathers must now have a couple of cold waters for a finish, and when dried and curled they are done.

*To Dye Feathers Violet.*

These feathers having been prepared in alum with the puces, we will dye them violet. Putting one quart of logwood liquor to four quarts of water in a jar, heat it



up to hand-heat with the feathers in it. Take the feathers up, throw the liquor away, and make up a similar liquor in the jar with a teacupful of blue orchil in it. Put the feathers in this liquor, and heat it up to hand-heat, and they are dyed violet. Give them two clean cold waters, dry, and curl.

*Another Method of Dyeing Feathers Puce and Violet.*

Put in the jar three quarts of logwood-liquor, and three quarts of clean cold water; put in this liquor the feathers for puce and violet, and heat it up to hand-heat. Take the feathers out, put in the liquor a teacupful of muriate of tin, put the feathers back into it, and let them lie in it until it cools, and then get them up and rinse in two clean cold waters, and the puce is dyed, and when curled, finished. The violet is now to have four quarts of clean water and half a teacupful of scalded Saxon blue in the jar, and to have time in it, without heat, until you have the shade of violet you require. When the feathers are the color you want, get them out and rinse in two separate pailsful of clean water, with a little common sour in each water, and they are dyed a cheap and strong violet color. There are other methods of dyeing puce and violet, but the above are the best.

*To Dye Feathers Amber and Yellow.*

Clean and dye these colors with quercitron bark, weld, fustic, and turmeric. They must have a tinge of annatto on them when they are for amber. They must be prepared in cold alum for any yellowish dye-stuff except turmeric, which is a self-color. The quantities of preparation and drugs are—ten parts to one of feathers. The drugs must be boiled well, and strained, and the feathers must be dyed in the liquor. Turmeric must be scalded, not boiled, or strained when scalded. Put the feathers in for five minutes, get them up, put a little tartaric acid in the liquor, and return them for five

minutes, and they are dyed. Rinse, dry, and curl, and they are done. This is the easiest method for ambers and yellow.

*To Dye Feathers Cinnamon and Cinnamon Brown.*

Clean and put as good a body of annotto on these two colors as you would if they were for scarlet; top off the cinnamon with a little fustic liquor, and orchil (half a pint), heated to a hand-heat. Rinse, dry, and curl, and the feathers are done.

Put the cinnamon-brown in the yellow and red liquor that the cinnamon left; give ten minutes; get it up and sadden it in clean water, with a little copperas melted into it. Handle the feathers in, then rinse, and return it in the dye-stuff, until you make them any brown you like—light or dark; rinse, dry, and curl, and they are done.

*To Dip and Clean Black Feathers.*

There are plenty of black feathers that only want cleaning. They are, in the first place, stuffed with dye-stuff in the first dyeing; and, to make it worse, the feather-dyers make it a rule to give black feathers plenty of oil after they are dyed, to jet them. Now when this oil and dirt are removed by the soap and water (mind, there must be nothing else), the feather will show what it is, and the black too. When feathers are a rusty black, give them copperas, and warm water; then rinse the acid out of the copperas, and give them a warm liquor of logwood and soap; dry out of it, and curl, and they are done. They want a little oil, however, to jet and gloss them, for, like human hair, they want it after cleaning or dyeing. It is not seen or felt on them, the curling before the fire takes it off—even then they look and feel so much better for it.

*To Dye Feathers Lavender, Drab, and Slate.*

Lavender is dyed with orchil, first, a full French white, and then bluing it by dipping in clean spring water, with a little alum in it, and scalded Saxon blue. The blue must be used with care. Lavender is often dyed with logwood and muriate of tin, very weak.

Drabs are dyed with sumach, saddening, and fustic, and reddened with orchil and fustic to clean them.

Drabs are dyed with cudbear, fustic, and copperas, by giving the copperas first, then a rinse in clean cold water, and fustic, cudbear, and sumach; rinse, dry, and curl.

Slate color is dyed with logwood first, then saddened, and a thin liquor of blue orchil to clean it.

Slate color is also dyed with sumach first, and then saddened in copperas and water, if for a light slate. If for a dark slate, it must have a little logwood in the sumach, and be returned in the saddening; in the rinsing it must have a very weak sour. Dry, and curl, and the work is done.

Most people think if they wet a feather thoroughly, dye, or not dye, that they must spoil it. That is absurd. A feather will clean, dye, and dry as easily as anything else; but it must not be handled roughly. No other care is required. It must not be wrung, but the liquor must be combed out of it by hand, and the feather laid flat on a dry sheet and covered over, and the hand passed over the sheet and shifted in the sheet until dry. All feathers do not require this, and will dry very well in a warm room.



## CHIP, STRAW, AND LEGHORN BONNETS.

*To Clean Bonnets.*

MAKE a clean warm soap liquor ; put the chip, straw, and leghorn bonnets in it, and rub them well inside and out with a brush ; when this is done, rinse and bleach them. Some persons bleach them with salts of sorrel or oxalic acid, and some with brimstone. When they are bleached with salts of sorrel or oxalic acid, it is put in a clean vessel, and as much scalding water put on it as will barely cover one bonnet at a time. Have a clean stick, and, putting the bonnet into the salts, keep it under the liquor five minutes ; take it up, and put in another for five minutes ; and then the third for the same time, when the three are cleaned, and ready for sizing or gumming when dry. For bleaching in brimstone, see page 137 ; but I do not recommend it, on account of the bonnets getting yellow so soon after they are bleached in this manner. Salts of sorrel and oxalic acid are both good, in my opinion.

All bonnets for dyeing, except for black, must be well cleaned, but not bleached, before they are dyed. Parchment size is best to stiffen white bonnets or light colors. It is sold at Fox's, in Compton street, Soho square, ready for use. Three-penny-worth, heated up without water in it, will be plenty to stiffen three bonnets, but it must be well worked in—wrong side first. Give them enough, but do not slop them. After this dry them, and then damp, block, and wire them, and they are fit for use.

*To Dye Bonnets Peach.*

To Dye one chip bonnet peach color, put four ounces of cudbear in one gallon of water, make it boil, and put one ounce of soda in the liquor. Put the bonnet into

the liquor, and boil it well for half an hour. Take it up, cool, rinse it in two cold waters, and dry it in a warm place; and when dry, get one pound of the best size (Young's, of Bermondsey, is the best) and melt it in a teacupful of water, and with a small clean sponge size the bonnet all over, first doing the inside and finishing with the outside. This sizing must be done clean and regular all over the bonnet. It is best to put a clean cloth of some sort on a table or board, and sponge the size into the bonnet on it. It must now be dried, and when dry, damped with clean water and blocked; and after it is blocked, it must be wired and shaped, when it is fit for use.

REMARKS.—I have confined myself to dyeing one bonnet peach color, but the dye and size that are left, without any addition, would dye another; and with the addition of more and other drugs, I could continue to dye many colors. But if I were to adopt that many-color principle in one liquor, I should never have done writing; so I will only dye one or two colors with the dye-stuff liquor I begin any color with for the future.

### *To Dye Bonnets Silver Gray.*

Boil two ounces of cudbear in one gallon of water, with half an ounce of alum and a quarter of an ounce of extract of indigo. Put the chip bonnet into this liquor, and boil it for twenty minutes. Take up and cool, and if not full enough, return, and boil it again for twenty minutes more. Take out, cool, and rinse in a couple of waters; dry and size, damp, block and wire as before directed.

### *To Dye Bonnets Blue.*

To one gallon of water, one ounce of alum, and one ounce of extract of indigo, put the chip bonnet, and scald it for twenty minutes; then get it up, and rinse in a weak acid water; dry in a warm place as quickly as

possible; and when dry, size, damp, block and wire as before directed.

*To Dye Bonnets French Blue.*

In one gallon of water put half an ounce of crude tartar and half a pound of copperas; boil the chip bonnet in this five minutes; get it up and rinse it. In another vessel, melt one ounce of yellow prussiate in one gallon of water. Put the prepared bonnet into this, and boil it for five minutes; get it up, and without rinsing, put it back into the copperas, and simmer it for five minutes; get it up, rinse it, and return it in the prussiate; and so go on, giving it five minutes in the prussiate and five minutes in the copperas, until you have any dark blue you like or want; size and finish as before directed.

*To Dye Bonnets Light Fawn.*

Boil four ounces of sumach, four ounces of crop madder, four ounces of old fustic, and half an ounce of alum in one gallon of water; and put your chip, straw, or leghorn bonnet in this liquor, and boil it for ten minutes. Melt four ounces of copperas in one gallon of cold water, put the bonnet in it, and let it stop in for ten minutes; then get it up, and rinse it in two pails of clean cold water; return it in the first liquor, boil it well therein for ten minutes, and it is done. Dry, size, and finish as before directed.

*To Dye Bonnets Lavender and Slate.*

In four gallons of water put four pounds of logwood, one ounce of alum, one ounce of bluestone, one ounce of soda, and four ounces of blue orchil. Boil the chip, straw, or the leghorn bonnet in this for half an hour; get it up, rinse it, and the chip is done lavender. Put in the dye half an ounce of copperas and two ounces of



muriate of tin ; put the straw and leghorn bonnets back into this liquor, boil them well in it for one hour, and they are done slate color. Get them up, rinse them in four or five clean cold waters, dry in a warm room, and then size and finish as before directed.

*To Dye two dozen Chip, Straw, and Leghorn Bonnets Black.*

Get seven pounds of Campeachy logwood, and two pounds of copperas. Put all the logwood in a copper that will hold six pails of water, and make it boil for ten minutes. Sort out one dozen of straw bonnets, and put them in the logwood while it is boiling, one by one, and give them a good boil for half an hour ; then fill the copper with cold water, open the copper door, and put the bonnets to drain out of the copper. Now put in the other dozen of bonnets to boil for one hour, leaving your boy to see that they don't stick to the copper and burn. Have a vessel that will hold eight pails of cold water, into which melt the two pounds of copperas ; stir it well, handle the first dozen of bonnets in it, and leave them for half an hour ; make up two rinsing waters, take up the bonnets out of the copperas to drain, rinse them in two cold waters, and drain them. Take the second dozen of bonnets out of the copper to drain, throw them into the copperas water, and then leave them. Put the first lot of bonnets back again in the boiling logwood, and boil them well for half an hour. Take the second lot out of the saddening, rinse them, throw the first lot that is in the boil into the saddening, and they are dyed. Now put the second lot into the logwood again, boil them well for half an hour, throw them into the saddening also, and they are dyed. Rinse all the bonnets in a couple of clean waters, and put them to dry ; when dry, well brush and size them. Dry out of the size, and block them ; when blocked, wire, and rub a little oil on a black rubber or brush,

and with it touch each bonnet regularly over, and they are ready for the customers.

REMARKS.—The reader will see that I have dyed, rinsed, and hung up these two dozen of bonnets in four hours, and they could not be done in that time only that I saddened, rinsed, and returned them a second time in the logwood. If the number is less, there must be less dye-stuff used, and if more, there must be more drugs.

### *To Dye Bonnets, Chocolate Brown.*

In two gallons of water boil one pound of logwood chips, one pound of redwood, and one pound of fustic chips ; boil one straw and one chip bonnet in this liquor for one hour, and get out on a peg to drain. Now melt one pound of copperas in a pail of clean cold water, and handle the bonnets in this for ten minutes, and then get them out and rinse them in a couple of clean waters, and return them in the dye-stuff, and boil them well again for one hour, and the chip bonnet is done. Sad-den the straw bonnet a second time, rinse, and return it in the dye-stuff again, and boil well for twenty minutes ; get it up and it is done. Now rinse both these bonnets, and when dry, brush them well before you size them, dry them after the size, then damp, block, and wire them, and they are finished.

### *To Dye Bonnets Devonshire Brown.*

In my instructions to dye these bonnets, the reader must observe that all and every one of them must be well cleaned with warm soap and water, and well rinsed before they are fit to be dyed. Now we will begin and dye one chip, and one straw bonnet, Devonshire brown, by first boiling them in a clean vessel, in one pound of ground alum, and one ounce of bluestone, for one hour. Then get them up out of this preparation, and rinse them well in a couple of clean waters. Put in a vessel that will hold four gallons of water, one pound of peach-

wood, one pound of redwood, one pound of fustic, and a quarter of a pound of logwood ; make all these woods boil for ten minutes, and then put in your two bonnets, and boil them well in this for one hour ; get them out and hang them on a wooden peg to drain. Melt one pound of copperas in a pailful of clean water, and handle the bonnets in this for a quarter of an hour, get them up, and rinse in a couple of waters, return them again in the dye-stuff, and boil them in this another hour, and the chip is done ; if the straw is wanted to be darker, it must be put through the copperas again, rinsed, and boiled for ten minutes in the dye-stuff, and it is done. Now rinse the two bonnets, dry them, and well brush them before they are sized. Dry them after the size, damp, block, and wire, and they are finished ready for use.

This is the most difficult color the cocoa-nut fibre mat makers and straw and chip bonnet-dyers have to dye ; and the sole cause of these failures is, that they do not prepare their work in a proper manner, to take the dye-stuff. Their system is to boil in the dye stuff *first*, and then get up the work, and put the preparation in the dye-stuff, which stops any more *color* going on. But it does not stop the cocoa-nut fibre, the chip, or the straw getting a darker color, not a *richer color*, which these dyers most want.

### *To Dye Chip Bonnets Lilac and Slate.*

In one gallon of water boil one pint of blue orchil, one ounce of logwood chips, one ounce of soda, one ounce of ground alum, and one pound of common size. Boil the chip bonnet in this liquor one hour, get it out to cool and drain on a peg, rinse it in two cold waters, dry it in a warm room, and when dry size and dry it ; then damp, block, and wire it, and it is ready for use.

A bonnet can be dyed slate color with this same dye-stuff by boiling it for half an hour therein ; get it up to cool ; in a pailful of warm water melt four ounces of copperas, and handle the bonnet in this liquor for ten



minutes ; rinse it, return in the dye-stuff, boil it well for half an hour, get it out and rinse it in a couple of waters, dry it, and when dry, size, dry, and finish it as before directed. The dyeing of this last bonnet slate color without any more dye-stuff being added to the liquor helps to cover the cost of dyeing the first bonnet. This plan must be adopted for one color to follow another in the same dye-stuff, to make dyeing of any sort pay.

*To Dye Chip and Straw Bonnets Purple.*

In a vessel that will hold two gallons of water put one pound of alum and one ounce of bluestone ; boil two bonnets well in this preparation one hour ; then get them up on a peg to drain, cool, and rinse.

The vessel in which they were boiled in alum will do to dye them in, after throwing away the alum liquor and cleaning the vessel well. Fill it with clean water, and put in it one pound of logwood chips and one ounce of soda, and boil these well for half an hour. Strain the liquor into a clean vessel ; clean the vessel in which you boiled the logwood, and return the logwood liquor back without a single chip in it. If the liquor has reduced in boiling, fill it with water so as to have two gallons. Put the bonnets in this logwood liquor, the straw one a quarter of an hour before the chip, and boil them well for half an hour. Get them up to cool, and put in the liquor, half a pint of orchil liquor. Then put the bonnets back, and boil them for twenty minutes. They may now be got up, and rinsed in a couple of waters ; dry them, and when dry stiffen, block, and wire them, and they are ready for use.

REMARKS.—If the alum, logwood, and orchil were all boiled together with the bonnets, they would make a purple, but of such an indifferent sort that it could not bear a comparison with this ; and the cause is, that they were prepared in one liquor and dyed in the pure dye-stuff in another. It is a sure, clean and safe method, but because it takes time the bonnet dyers will not like

it; they like the color well, but they do not like the time it costs—the same dye-stuff will do.

*To Dye Bonnets and Cocoa-nut Fibre different Greens.*

We will presume that the cocoa-nut fibre is about as much in quantity as the bonnets. Boil up one pound of ground ebony in four gallons of water, three ounces of alum, and two ounces of the blue extract of indigo. Now boil the chips in these three for half an hour, take them out to cool, and the chip bonnet will do. Put it by, return the straw and fibre, and give them another half an hour's boil; then get them up, and rinse the bonnets and fibre in two cold waters with a little sour in them, and dry; size the bonnets when dry, and finish them in the usual manner.

Now this liquor, with a little addition of blue and yellow, will dye as much more work a grass green; and after they are dyed, half a pound of turmeric and four ounces of blue extract of indigo added to it, will dye the same quantity of work myrtle green; and, with an addition of blue only, a still darker green. This liquor saved, and a little blue added to it, will dye as much more of the above work, by letting it lie three or four days in the cold liquor.

*To Dye Bonnets Pearl Gray.*

In four gallons of water boil four ounces of nutgalls ground, half a pound of blue orchil, one ounce of blue-stone or verdigris, and one ounce of white argol. Boil the two chip bonnets in this liquor twenty minutes; take them up, cool them, and return them for twenty minutes longer; get them up, rinse them in a couple of waters, dry them, and when dry, size and finish them as directed before.

*To make Parchment Size.*

Take one pound of parchment shavings or cuttings, and wash them well in cold waters. Put four quarts of water in a vessel; put the parchment in it, and boil it gently down from four quarts to two quarts, and strain it through a fine sieve into a clean vessel, and it is fit for use. A teacupful of this is enough for one bonnet, and is enough for one quart of water for finishing silks. Put the rest to cool in a clean jug, and, when cool, it looks exactly like calf's-foot jelly.

This is the first boil of the cuttings. For the second put two quarts of clean water, and re-boil them for half an hour; take them off the fire, strain into a separate vessel from the first, and throw the cuttings away. In the second boil if you allow too long all the cuttings will dissolve in the liquor, and you will make a mess of it, and it will not be fit to use. There are two or three sorts of parchment cuttings, but I recommend the best as the cheapest. The best is sixpence a pound. I bought it at Fox's, Artist's Size and Colorman, Compton Street, Soho Square.

We use this size for finishing our silks, satins, velvets, and ribbons, whether cleaned or dyed; it is the best that can be made. A less quantity can be bought and made than a pound.

*To Dye Bonnets Marone and Crimson.*

Have a clean vessel that will hold four gallons of water, and put into it one pound of ground alum, and half a pound of crimson spirits; put your two bonnets into this liquor, and boil them well in it for one hour; get them up and rinse them; throw away this liquor out of the vessel; clean it well, and put into it two pounds of peachwood chips, and boil them well for half an hour, with the bonnets in it; get them up and cool, and return the bonnets; boil them again for another half-hour, and get them up to drain; the crimson bonnet is now



dyed. Put in the peachwood liquor one ounce of turmeric, and put the bonnet for marone back into this liquor, boil it well for half an hour, and it is done. Now rinse in two clean waters and dry, and when dry, size, then damp, block, wire, and they are ready for use. These colors are very seldom worn in bonnets, they are generally dyed in the bundle or plait, and worked in. As mixed straw bonnets they are difficult colors to dye, unless well prepared with a strong mordant. Cudbear only will dye ruby, crimson, and marone; it is a very simple process, and one pound will dye three bonnets. In three gallons of water, put one pound of the best cudbear, and one ounce of soda; put the bonnets in, and boil them well for half an hour, get them out, and the ruby is done; put the other two back, and boil another half-hour, get them up, and give the one for crimson, a little sour in a pail of water, with a rinse after, and it is done. Now put one ounce of turmeric in the cudbear, and put the bonnet for marone in, and boil it well for ten minutes, then take it up, and rinse it in two clean waters, dry, size, and finish, and they are done.

*Another Method of Dyeing Black and Olive.*

Take four bonnets, that is to say, one straw and one Leghorn, for black, and one straw and one Leghorn for olive; put one pound of copperas, and four ounces of blue stone in a vessel that will hold four gallons of water, and make it boil before the copperas and blue stone is put in. When these are in, put in the four bonnets, and boil them well for one hour; take them up, and put them on a peg to cool and rinse. Throw away the mordant preparation out of the vessel, rinse it well and put in one pound of Campeachy logwood, and one pound of miravelines, well pounded; make these boil, and put in your two bonnets for black; boil them well in it for one hour, and then take them out, and they are dyed jet black. Now put in this liquor one pound of ground fustic, and the two bonnets for olive; boil them well in

this liquor for one hour, and they are dyed olive. The dye-stuff that is left after dyeing these bonnets black and olive, will dye two more bonnets, or an equal quantity of straw or chip plait, light olive, by putting them in, and boiling them in it for one hour; then take them up, and put in the dye-stuff one ounce of copperas, and return, and boil well in it for half an hour, and they are dyed a good light olive. Rinse the six bonnets in three or four cold waters, and dry; when dry, brush, then size, and dry; damp, block, and wire, and they are ready for use.

REMARKS.—Chip bonnets of plait do not want so much dyeing as straw. Cocoa-nut fibre being a vegetable production, will take the dye if prepared and dyed in the same manner as the chip or straw.

*To make Size for Black, Brown, and Olive Bonnets.*

For one dozen of bonnets dyed black, whether chip, straw, or Leghorn: get one pound of the best glue, break it and leave it to steep in four quarts of cold water, over night, and in the morning put it in a saucepan on the fire to dissolve; it must not be left, but kept well stirred all the time, scalded, but not boiled, and when it is all well melted, which it will take some time to do, strain it into an earthen pan, and begin and stiffen the black bonnets and plait, one by one in the hot liquor (you must always keep it too hot for your hands, while using it), and as you get each bonnet out, you must sponge it as dry as you can while the bonnet is warm, regulate the shape and the plaits, and hang it up to dry, and so go on one after the other until the dozen are done, which will take about an hour to size in this manner. Where there are a quantity, and a large size pan of liquor, a dozen can be done in half the time. The dark-colored bonnets are to be stiffened in a similar manner, and to go on in the stiffening before the blacks. The black bonnets when dyed are very brown, but the hot glue stiffening takes all that off, and makes them jet directly.

Common, or parchment size will not do it; it is done by an oil rubber when these sizes are used. All dark-colored bonnets must be well brushed before they are sized. If there is only one bonnet to dye and stiffen, it is easy to count that if twelve bonnets took so much dye-stuff and size, how much will one take? The time it takes in dyeing one or a dozen is the same.

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## CHAPTER V.

### THE ART OF CLEANING AND SCOURING.

I THINK that the following chapter cannot be better introduced to my readers than in quoting a few remarks from 'Oberlin's Tracts' on Dirt:—

"The dictionary tells us that dirt is 'whatever adhering to any thing renders it foul or unclean.' Our eyes tell us that it takes away the beauty of whatever it touches. Our noses tell us that it is extremely disgusting. And our feelings tell us that it is repugnant to health and comfort and purity and social enjoyment. Dirt is not part of our nature; it is a parasite thriving on our heart's blood, like a vampire. They say the vampire sucks away the life, without the poor patient's knowing anything about it. It is just the same with dirt. Four-fifths of mankind live in dirt, and lose a large part of their health in consequence. What is it that robs the working classes, in many of our large towns, of nearly half their natural term of life? Dirt, dirt on the person, in the houses, in the streets, and in the air. What is it that makes the children fretful, impatient, and bad-tempered? Dirt again. What is it that keeps rich people from associating with the poor, from sitting by them at meetings, or letting them come to their houses? Often, not so much pride, as dirt. What is it that destroys self-respect, makes men careless and



degraded, and weakens the natural restraint of modesty? Dirt, again. What is it that makes the prettiest face ugly, the finest clothes tawdry, the cleverest man disagreeable, and the most splendid house uninhabitable? Dirt, again."

*To Dry-clean English, Brussels, Persian, and Turkey  
Carpets and Tapestry.*

Have them taken up and well beaten, brushed, laid flat on a floor, and the spots taken out by rubbing a piece of hard soap on the greasy spot, and rubbing it out with a brush and clean cold water, well drying each spot as it is done with a cloth before you leave it. Cut a bar of the best mottled soap into two gallons of water, and put it on the fire to dissolve, and when dissolved, begin and scour the carpet in the manner following: take two pails of blood-warm water, and put in one of them two quarts of the melted soap to scour the carpet with, and the other pail of warm water is to rinse the soap and dirt out of the carpet as you go on with the cleaning, which must be done at less than one square yard at a time. Now dip a brush into the pail with the soap in it, and lift it out on the carpet, and scour about a square yard at a time, while on the knees, and do it so as not to let it go through to the back of the carpet; when this spot or yard is cleaned well with a soap and brush, rub the soap well out by means of a flannel or coarse sponge, and suck up in the sponge or flannel the wet and dirt that was made on the carpet by the scouring-brush, by rinsing the flannel in a pail of clean water repeatedly. Have a pail of clean cold water and a little common sour in it, and have a clean sponge and dip it in the sour, squeeze it well, kneel down and rub the sponge well into the spot you have first cleaned and rinsed. Now this spot must be dried with clean coarse cotton or linen cloth, before you leave it as properly done, and before you proceed with another yard of the carpet.

Cleaning carpets dry exemplifies the old saying, and the true one, "you should rub off as you go." And so you must go on square after square yard, until the carpet is entirely cleaned. A good fire ought to be in the room to help to dry it on the floor, as fast as it is done. The floor must be clean and dry before you begin to scour the carpet, and the carpet beat and laid down.

REMARKS.—I have cleaned this carpet with the best soap, but I do not like it so well as Feild's oil soap, for after the mottled soap is melted, it congeals as it gets cold, whereas Feild's never congeals after it is once melted, and Feild's is the cheapest. It is to be had at Legg's, in Wardour street, Soho, and Barnes's, Longacre, and of the makers, Messrs. Feild, Fore street, Lambeth.

### *Second Method to Dry-clean Carpets.*

Have the carpet you are going to clean well beaten, brushed, and put on a clean floor; remove the grease spots out of it with fullers' earth, gall, and water, and a hard scouring-brush, and well rinse the spots and rub them dry before you begin to clean the carpet. Have a bag of bullock's gall, very fresh (a slaughter-house is the best place to have it from), and put two gallons of clean cold water in a pail, and melt four ounces of pearlash in it, and then put the gall in and mix it well with a stick, or your hand. Have two pailsful of clean water, a large sponge, a couple of flannels, and dry coarse cloths ready. Begin by dipping the scouring-brush in the gall and water, and scour the carpet with it as far as can be reached easily by the arms, while on the knees, as quick and as careful as possible, taking care none goes through the back in the scouring; when this is done, dry up the gall with the flannel or sponge, making use of the two pails of clean water to rinse the flannel, as well as to rinse the gall out of the carpet; this must be done nearly dry with the flannels, and finish the square, by drying with the cloths, before you begin another. By adopting this simple process a carpet may

be cleaned on a floor no matter what size it is. You must bear in mind that expedition in cleaning, and rubbing dry every square yard that is done, is all that is required to insure success. There must be a fire in the room while the carpet is being cleaned, for the faster it is dried the better.

REMARKS.—This is a very easy way to clean a carpet, but the gall must be from a fresh-killed bullock, or it will smell very much. I give the preference to dry-cleaning in soap, on account of the smell the gall leaves; other dyers and scourers like gall, when they can get it very fresh; it is certainly a very good way when the carpets are not very dirty, for it cannot injure the colors, neither does the soap, if it is sheeted up dry and no hanging on—that is what I am most afraid of in doing such work—but a master must be at the men's elbows while such work is doing.

### *To thoroughly Clean Carpets.*

Put it on a stone floor that has a fall to it, to drain off the soap and water used. Scour it with a scouring-brush with a long handle to it, and the melted mottled soap or Feild's soap, as above recommended; and when well scoured all over with the soap and brush, the soap and dirt to be well scoured out of it with a scouring-brush and plenty of cold water. After doing all this well, fold it up nicely on the flags, and lift it on the pegs to drain, so that all the soap and dirt may drain out of it. While the carpet is draining, sweep and rinse the flags well, put the carpet down again, and well rinse it a second time with clean cold water, well scouring the water off with the carpet-broom as it is thrown on. Fold up the carpet again nicely, and put it, a second time, on a peg to drain, and rinse and sweep the floor a second time. Put the carpet back on the flags, and well rinse it again, well scouring with the broom while the water is thrown on it with a pail, so as to effectually take all the dirt and soap out of it. When this is done, refold



and put it on the peg to drain, without any stoppage at the edges.

The flags must be well rinsed and again swept, and have a large tub (out of the way of the floor where the carpet is clearing), and to every twelve pails of water put in half a teacupful of oil of vitriol (not such as you would buy at a chemist's, but at the dry salter's), mix it well in the water, and spread the carpet regularly on the floor, and take a pail and pour the sour from the tub carefully over all the carpet, well working it with a carpet-broom. This is an important process in carpet-cleaning, and must be performed with care and attention to the colors, particularly where there are greens and blues. Now fold up the carpet very smooth, and put it on the pegs to drain, and it is done. This is what we call thoroughly cleaning, rinsing, and spiriting a carpet; the next process is drying it with as much dispatch as possible in a hot room, or in the open air on a dry day; when dry, nicely fold, and it is fit for use.

REMARKS.—This is the regular and proper way of cleaning carpets thoroughly, and they will look and wear as well as when new. The reader will see that cleaning the back of the carpet was not mentioned. I never clean the back of any carpet, as it ought not to be touched with the brush while the carpet is cleaning. It is sure to get clean with the face.

#### *Another Method to thoroughly Clean Carpets.*

Have a board placed on stands or horses, three feet high, the board must be three feet wide and twelve feet long, so that two persons can work at it; and underneath this board have other boards on the ground, to let the carpet drop on as you scour it. Begin and scour your carpet by placing it smooth on the scouring-board, face up, and with a hand scouring-brush and Feild's, or any melted soap you like, except the regular firkin soft-soap, that is made from fish oil, that is very good in its place, but not here, and when one board length is

cleaned pull it to you, and let it drop smooth on the board at your feet, and begin another board, and so go on, until all the carpet is well scoured with the liquid, soap and brush. When this is done, fold it up on the scouring-board, and put it on a peg to drain, so that all the soap liquor will drain out of it without any fold or stoppage. Clean away all the soap and dirt from the boards and floor, and begin and rinse the carpet with clean cold water, by placing it on the scouring-board as at first and scouring the dirt and soap out of it with plenty of clean cold water. Having done this, fold it up, and put it on the pegs to drain, and clean the boards and the floor a second time. Put the carpet back on the scouring-board, and well rinse it again with plenty of water. When this is done, fold it up smooth and put it on the peg to drain, and well clean the scouring-board, the board at the feet, and all places about. And now make up a common sour to finish the carpet with, and to every twelve pails of water put in a quarter of a pint of oil of vitriol. Put the carpet on the board and scour this spirit water into it regular and well, square after square, until all the carpet is done. Now fold it up and put it on the peg to drain, dry it well in a hot room, or in the air on a warm day, and, when dry, it is ready for use.

REMARKS.—I like this manner of cleaning carpets much better than laying them down on the flags; however, both ways are good, but I prefer the scouring-board to the floor. All these processes seem long, but the carpet ought to be hung smoothly on a peg to drain when it gets one liquor before it gets another, there is where the process seems long, but it is a cheap and safe way, for the clean soap directly gets into the carpet when the dirty soap is drained out of it; it is the same with the rinsing and spiriting.

*Another Method of Cleaning Carpets.*

Have the carpet well beaten, and spot the grease out with fullers' earth and gall. For a carpet of about thirty yards, have two large gall-bags fresh from a slaughter-house. Put six pails of clean cold water in a vessel; add thereto one pound of pearlash which has been melted with hot water, and then the gall, and mix well together. Spread out the carpet either on the flags or the scouring-board, and use this preparation exactly in the same manner as if it was melted soap—scouring, rinsing, and spiriting just the same. It must also be dried like the other two carpets.

REMARKS.—This is a very good way to clean carpets thoroughly. They must be very well rinsed, and dried in the air if possible. If potash is not handy, soda will do as well to soften the water.

When a carpet is to be cleaned thoroughly that is too large to handle conveniently, the easiest and best way is to rip it into parts of three or four widths each. They are more safe and handy to clean, and it is very easy to sew them together again. I always do so with the carpets I have to clean, and send them home ready to put down, and my customers do not know it. I take down the seams for my own convenience, for it lessens the expense both in time and materials, and, of course, I ought to sew them up again, and send it home as I had it, ready to lay down, and not charge for re-sewing it. I have often in my time had orders from very particular customers to rip their carpets in single widths and thoroughly cleanse them, which I always did, with soap and water, and when they were dry, hot pressed them. It is more troublesome, but it is a very good way when two carpets are to be made out of one large one.

*To Dry-clean Carpets with Ammonia.*

Have the carpet well beaten and brushed, and laid down on the floor. For a carpet of thirty yards have



one gallon of liquid ammonia and four ounces of pearl-ash; melt the pearl-ash in clean hot water, and then pour it into the ammonia; stir them well, and the liquor is fit for use. Have also, before you begin, a strong coarse sponge, four or five pieces of coarse flannel, as many coarse clean sheets, and one hand-scouring brush, all ready. Now begin and dry-clean the carpet. Have the ammonia in a small pan or clean pail, and dip the sponge or flannel in the ammonia; take it out middling wet, and work the ammonia well into the carpet as far as you can reach on your hands and knees, but you must not let it go through the carpet. Take your brush and wet it in the ammonia, and scour the part that has been sponged quickly and well. Squeeze the ammonia out of the sponge or flannel, and suck up with it the dirt the brush has disturbed. Put by the sponge, wipe the spot dry with the pieces of flannel; and, for a finish, wipe the spot dry with the sheets before you get off your knees. Now you have cleaned one square yard of the carpet, which occupied about twenty minutes. Go on and clean the remainder of the carpet in squares by the same process.

REMARKS.—This is a very simple process to dry-clean a carpet, but it has one drawback—it smells of the ammonia a long time afterwards if kept in the room where it was cleaned. The remedy is simply, after the carpet has been cleaned on the floor, to take it up and hang it in the air for three or four days, and all the smell will go off. It must not get any rain or wet while it is out of doors. The liquid ammonia is sold by dry-salters.

### *To Dry-clean Hearth-rugs.*

Put the hearth-rug on a large board after it has been well beaten and brushed, and melt in one gallon of hot water one pound of Feild's soap or mottled soap, no matter which. When all the soap is dissolved, let the liquor cool to a hand heat, and then begin and clean the hearth-rug. Have a coarse flannel or sponge, dip it in

the soap, and carry it pretty wet to the rug. Make six parts of the rug, and clean and dry one part at a time. Rub the rug well with the sponge containing the liquid soap, but without letting the liquid reach the back; then scour it gently with a hand scouring-brush; afterwards, rinse the soap and dirt out of it with a flannel dipped in a pail of warm water, and put on the rug to suck up the dirt and soap; the flannel is to be rinsed in warm water and wrung out, and then well rubbed into the rug often, until all the dirt and soap is taken out of the part begun, and it must be rubbed dry with a clean cloth before you leave it to begin another part. After it is cleaned the rug must be dried very quickly, for, being very thick, it is apt to sadden if it is too long in drying. After it is sheeted up have a little common sour in a pail of clean water, and, having a clean sponge, dip the sponge in the sour, squeeze it, and rub it well all over the face of the rug and spiriting; dry this up with a clean sheet also.

#### *Another Method of Cleaning Hearth-rugs.*

The reader might suppose that when I give instructions for a carpet or hearth-rug to be dry-cleaned, that in the process I do not intend to use any sort of a liquid. It is no such thing. There is no carpet or hearth-rug of any kind that can be cleaned entirely dry. Fullers' earth, pipe-clay, masons' dust, &c. may be tried, and when tried it will be found that they have made it worse. Besides it is almost impossible to beat, brush, or shake these things out when once they fasten on it. It is well enough to take a spot of grease out of a carpet or rug with fullers' earth; but the attempt to clean a carpet or rug all over in the same manner would not do at all. It is all nonsense to talk of entirely dry-cleaning, it cannot be done; it is sheeting up dry after it is cleaned by a liquid, is meant dry-cleaning.

What we mean by dry-cleaning is, that when once we begin to dry-clean a carpet or rug, we do not leave it

until it is nearly dry. There is nothing so good as liquid soap and water, or so gentle for the colors, as it is good for the wool and the colors if no alkali is used with it. Next to soap is gall, and with it I will dry-clean this rug, by first beating and brushing it, then putting it on a board and dry-cleaning it with one fresh gall-bag in a pail of clean cold water. Have a coarse flannel or sponge, and dip it in the gall and water, and put it on the rug. Finish it every way like the hearth-rug that has just been dry-cleaned in soap.

*Cleaning and Calendering Curtains, Furniture, &c.*

There is no necessity to take apart this furniture. It will clean and calender to look equal to new. Being made up they will not be so stiff as new, but they will be as clean and as glossy. It is very necessary that the public should know that this furniture can be cleaned and calendered without being taken to pieces. There is some printed furniture that has been taken to pieces—not that it is necessary to do so for cleaning and glazing, but for alterations in linings and other causes. When that happens, the best way is to take them entirely apart and have them friction-calendered, and they will then look equal to new. To clean twenty yards of printed furniture bed or window curtains, a sofa cover, a squab, two cushions and half a dozen of chair covers, first melt a bar of mottled soap in four gallons of boiling hot water, and see that it is thoroughly dissolved in the water. Have three vessels, and in each vessel put four pails of clean cold water, and in the vessel or tub you put your print in first, put a gallon and a half of the melted soap liquor. We shall call this the first liquor. Now put in the second clean water a gallon and a half more of your melted soap for the second liquor. After you have well rubbed, punched, and turned them in the first liquor, wring them out of it; and put them into the second soap liquor, and punch, rub, and turn them well in this to clean them. Wring them out of this



second soap liquor, and put the gallon of melted soap left into the third vessel or tub, which is called a thin soap liquor, and punch, rub, and finish cleaning them in this liquor. Wring them up, and give them a clean water directly, and they are cleaned ready for rinsing, for stiffening and drying. Save these three soap liquors in one vessel, and give the print three warm waters, not too hot, one after the other to take out the soap; wring them well out of the waters and starch them next. Have a quartern of the best flour, and put it in the small copper kettle mixing it well with cold water; when well mixed put two pails of scalding water on it, and put it to swim in a boiling copper for half an hour, with two ounces of beeswax in it, well stirring it now and then, and it is fit for use. Take it out, cool it, strain it into a clean vessel, and starch the print you have just cleaned by well working the starch all through. When this is done wring it up, well shake it, and fold it neatly; dry it, and when dry, send it to the calico-glazers.

REMARKS.—If my time will allow it I like to clean, rinse, and dry my print before I stiffen it. It then takes a fourth less starch, and is much stiffer than when it is stiffened while wet.

#### *To Clean and Calender Printed Furniture and Lining.*

Make up two clean cold waters in a punching-tub, and then punch your print well in the first tub; throw it on a peg to drain, and let the lining follow in the same water, punch your prints also through the second water, and the lining is to follow, and put it to drain. Now we will clean this print with a bar of Feild's soap, melted in four gallons of scalding water. Have three vessels, and put four pails of clean cold water in each vessel, and a gallon and a half of the melted soap in the first and second tub, and one gallon in the third tub; go on cleaning your print and lining one liquor after the other, as you did in the unpicked or lined print, until both are well cleaned, and be sure to let the print go in all the

cleaning and starching first. These eighty yards of furniture and eighty yards of furniture lining will take a quartern of flour to stiffen them for the friction-calender, and I will now direct how to stiffen them, Lined furniture, that is sofa, chair cover, and hangings not unpicked, must have starch very good and strong, and we are obliged to use a good deal of labor to get into the lined work. Whereas, in the unlined print and lining we only want a thin starch, and for it to be passed regularly through it, when it is for friction-calendering. If this print is to be glazed, it must have strong starch, although it is in pieces.

REMARKS.—Printed furniture and lining for friction-calendering must be taken apart in breadths, and have half a quartern of flour and two ounces of beeswax to eighty yards; in wringing them out of the starch they must be wrung across the breadth, and shook out and folded directly, the ends and the edges must be well shook out, and hung up very straight by the ends, as the friction-calenderer, which is Mr. Baverstock, Great Russell street, near the British Museum, for the West End, cannot or will not do them else, as he thinks, and very justly, that the work should be shook out while it is wet, and not after, and not by him by any means.

### *To Dry-clean Ancient Tapestry.*

Take a good, strong, long-haired clothes-brush and brush it well, and have a pointed brush to remove all dust out of the corners. Now prepare for cleaning it by first melting a bar of Feild's soap in one gallon of water, and, when melted, put one quart of it in one gallon of clean cold water, have at hand by you some pieces of flannel, a soft brush, a piece of wash-leather, and some dry clean sheets. If it is on the wall, begin to clean it at the top, and only clean one square yard at a time. Now dip your flannel in the soap and water pail, squeeze it out gently, and rub it well into the tapestry, so as to make it lather; have a soft brush, and brush the square you are cleaning well; after this wring the flannel out

of the soap, and rub it dry with the soapy flannel and wash-leather, and sheet the spot dry, with the soap in it, as it must not be rinsed. Put two gallons of clean water in a pan, and melt four ounces of tartaric acid in a pint of boiling water, then put it in the pan with the cold water; have a clean sponge and put it in this acid water, squeeze it, and rub it well into the spot you have just cleaned and dried, and when this is done it must be well dried with a dry sheet before it is left; when this last process is finished move on to the next top square yard and go on exactly in the same manner as the first square, and so on square after square until all is cleaned. You must not continue to use the same soap and water you are cleaning with always; when it gets dirty, throw it away and make up fresh; also change the spirits, the flannels, and sheets, for they must be used clean.

REMARKS.—This is the only safe and proper way to clean ancient tapestry. There are many other ways, but every one of them injurious and bad. There must be a good fire in the apartment while the tapestry is cleaning. When this is dry take a lump of pipe clay and rub it into it, and with a clean clothes-brush well brush the pipe-clay out of it; this pipe-clay and brush takes the soap and spirits out of it, and brightens the colors. Powdered whiting is preferred by some, but is very annoying, it makes such a dust.

### *To Clean and Water Scarlet Moreens.*

Two window curtains of scarlet moreen, three widths wide and three yards and a half long, are forty yards. To clean this, have six pounds of the best soap, and three pounds of pearlash; cut the soap in shavings into a little kettle, and put eight gallons of scalding water on it, stir it well, and cover it over until it all dissolves. Put the ash to melt by itself in a clean vessel in eight quarts of scalding water. Now begin and clean the moreen, by making two lots of it—that is, twenty yards



in each lot—by first giving it two clean waters, and well working it in each water, one lot following the other; fold them up on the puncher-head or a clean flat board, and put each lot on a peg to drain by itself. Now begin and clean them in soap. Put six pails of blood-warm water into a tub, two quarts of pearlash liquor, and two gallons of the soap liquor. Now put one lot of the moreens in this liquor, and work it well in it with the puncher for ten minutes, and fold up and put them on the peg to drain; get in the other lot, do the same with it as you did with the first, and fold it up by itself on a peg to drain. This first liquor is now no good, therefore throw it away, and make up another like the first, and let the second lot go first this time; well punch it, and turn and punch it again for ten minutes; get it up to drain, and put your other lot in the liquor, do the same with it, and get it up and put to drain. Now empty the tub again, saving the liquor in another vessel, make up a third soap liquor in the same manner as the first, and put the last lot first again in this fresh soap liquor; punch and turn it well for fully ten minutes, fold it up, and put it to drain; do the same also with the other lot, and turn over this into the old soap bin, and then make up another soap liquor to finish them; this we call a thin soap liquor, and let your second lot go in first, and punch them well for ten minutes, fold up and drain; put in the other lot, and punch and handle them for ten minutes, fold up, and put on a peg to drain, and they are cleaned, all ready for spiriting. Now have the tub they were cleaned in filled with clean cold water, and if it holds twelve pailsful, put half a pint of oil of vitriol in it and well stir it. Open your first lot of twenty yards and handle them well in this spirit and water for ten minutes, fold up to drain, and put a quarter of a pint of oil of vitriol in for the second lot; handle this lot well for ten minutes, and get them up to drain, and throw the spirits away out of the tub, rinse it and fill it with clean cold water, and rinse the first lot in it, and fold them up nicely out of it, for they

are finished. Then throw this water away, and fill the tub with clean water, rinse the second lot through it, and nicely fold them up, put them to drain and they are done.

Now these forty yards of scarlet moreen are cleaned, spirited, and ready for drying, and they must be hung up in a warm room by the ends of the breadths, the middle hanging down. This must be attended to, as they must be dried straight, so as to be re-made straight, and hang again like new. When they are dry they are to be picked, shook well, and sent to Baverstock's, Se-grave's, or Hall's, the pressers, to be watered, embossed, a satin and a watered stripe put on them, or finished plain. These are the four ways we have for finishing moreens, whether cleaned or dyed, and the owners have only to choose which way they will like their moreens finished. The charge is the same per yard for finishing them in any one of the above ways.

*To Clean and finish forty yards of Scarlet or Crimson  
Damask or Moreens.*

I began cleaning these bed and window curtains of all colors of moreens and damasks by cleaning the scarlet moreens first. They are the most difficult of all in the cleaning from three causes. The first is, that the dyeing they get when new never goes into the heart of them, and it requires great care in cleaning to keep on the color ; the next is, they are so harsh in their make ; and the third, and not the least evil, is that they are almost always dirtier than any other sort of work that comes to be cleaned and finished. Knowing all this from experience, I thought it would be the best arrangement to clean the scarlet moreens first, as a guide for cleaning the rest of the moreens and damasks that are to follow.

The best instructions that I can give for cleaning either of these lots of scarlet, or crimson damask, or moreen, is to clean and spirit them in the same manner as

the scarlet moreens above were cleaned. They must be dried with the ends upwards, and picked and shaken in the same way, but *not* finished in the same manner, as they must be hot-pressed at any of the pressers I have before mentioned—the crimson moreens as the person likes, plain, watered, striped, or embossed.

*To Clean and Finish Scarlet or Crimson Worsted and Cotton Damask.*

Scarlet and crimson woollen and cotton damasks are cleaned exactly in the same manner as the above, but after they are spirited and rinsed, they must have a water starch to make them look strong and well; when they are finished at the regular pressers they look like new.

*To Clean and Finish Blue Moreen and Blue Damask.*

This blue moreen and damask must be cleaned in two lots in clean blood-warm soap liquors, and exactly in the same manner as the scarlet moreen is cleaned and spirited, rinsed, dried, and finished, as far as regards the moreen; the damask must be hot-pressed. These blues will look well if cleaned expeditiously; and with care they will not lose any color in the cleaning. They must be finished as above.

*To Clean and Finish ten yards of Blue Satin Striped Tabaret.*

Tabaret is made from cotton and silk, with a satin stripe. It is generally made all one color, but those most common are crimson, green, amber, and blue. It is also made with a stripe of a different color to the ground, and the ground is always watered. It is splendid furniture. I will now begin and clean it. Take two pounds of Feild's soft soap and dissolve it in two gallons of boiling water, and while it is getting cold prepare for



cleaning the tabaret. Put the clean scouring-board on the stands, and put the clean silk scouring-brushes on it, make up three clean cold rinsing waters, with six pails of water in each vessel, and have another vessel with as much common sour in it as will make it taste, and a kettle with four pails of water for a thin soap liquor. This ten yards of tabaret is one curtain three widths wide, and nearly three yards and a half long. Now make a small soap liquor, with a pail of cold water and one quart of the soft soap liquor in it, put one breadth through it, and put it on the scouring-board, wrong side up, and clean it well by pouring some of the soft soap just melted on it, and brushing it with the silk brush. You must not be five minutes cleaning the wrong side, then turn it, and clean the right side quick with the brush and more soft soap. Now get it off the board, and pass it through the first soap liquor, then the thin liquor, the rinsing water and the spirits, and handle it well in the spirits for two minutes, fold it up, wring it and shut it up, dry, and before you leave it, brush it with your dry silk brush, hang it up, and when dried thoroughly, it is ready for watering, and will, when watered, be as good as new. The next two breadths are to go through exactly the same process one by one. So you could go on if there were fifty of them, and not make a single mistake or lose a bit of color if my instructions are strictly attended to. Of course you would want more materials, for I only had enough to clean ten yards. Clean dry sheets at this work cannot be dispensed with. It must be damped, brushed, and watered for a finish, and when done it will look like new.

*To Clean and Finish Blue, Green, or any other colored  
Tabaret.*

There are many different methods of cleaning tabarets thoroughly, but it is much the best to give one sure

and safe method of cleaning this very important and good work. If any of my readers want another method, let them write to me and they shall have it, inclosing their address on an envelope and a stamp with it, and without these I will answer no letter. I will now begin and clean ten yards of any colored tabaret, whether plain, figured, or striped. First, scald two pounds of Feild's soft soap in four quarts of water, and make up three clean cold rinsing waters, with four pails of water in each vessel, and another vessel with four pails of clean cold water and as much common sour in it as will make it taste, and a kettle with four pails of water in it for a thin soap liquor, and make up a small soap liquor with two pails of water and one quart of the soft soap liquor in it. I would begin and clean a breadth or width of any sort or color of tabaret by putting it on the scouring-board and clean, rinse, spirit, sheet up, dry, and brush, exactly in the same manner as I directed to clean ten yards in three widths of the blue satin-striped tabaret, and so go on cleaning, rinsing, spiriting, sheeting up, drying, brushing, and hanging up each width as I cleaned it, until I had finished it. When all the tabaret is cleaned and dry, damp and brush it, and shake out the ends of the widths well, clip the ravelled ends, and send it to Baverstock's, Segrave's, or Hall's, the pressers, waterers, and embossers, to be watered, and when it comes home from any of them it will look like new and be ready to re-make.

*To Clean and Finish Plain or Figured Satin Bed or Window Curtains.*

This work is to be cleaned exactly in the same manner as the plain or figured tabarets, and when dry, to be damped, brushed, and framed (see Frame for finishing silks, page 28) and when framed sent to the presser's to be finished. Law and Son, silk finishers, calenderers, and embossers, Monkwell street, London wall, City, finish this kind of work in a superior manner. Picard,

silk waterer, and satin dresser, Noble street, Foster lane, Cheapside, also finishes this sort of work to look like new. Some dyers and scourers have their satins damped, brushed, and sent to the calenderers to be pitched, and when they come back have them framed, stiffened with gum on the back, and steamed with clean water on the face; the sponge that is used for steaming must be nearly dry, and used on the satin while the charcoal fire is under it, and the steam curling on the face at that important time, the sponge is used in facing it lengthwise on the face of the satin; it does not want any more finishing when done by this method except redressing by the pressers. Some dyers and scourers damp, brush, and calender this work and give it no other finish. If it is a superior damask, and in good condition when it is sent to be cleaned it wants no more finishing.

*To Clean and Finish Silk Damask Bed and Window  
Curtains.*

These damask curtains are to be cleaned with Feild's cold soft soap, rinsed, spirited, and sheeted dry, as the blue tabaret was cleaned, and when dry, damped, brushed, framed, and sent to the pressers to have the finishing on them; and when that is done they are ready for remaking, and they are as good as new.

*To Clean and Press Silk and Worsted French Damask  
Bed and Window Curtains.*

These damask curtains are from one and a half to two yards wide, and made of silk and worsted; they are a very heavy and splendid hanging, and when well cleaned they look equal to new.

We will begin and clean one curtain nearly three yards and a half long, and two yards wide, which is equal to ten yards of the usual width of damasks. Dissolve, in eight gallons of boiling water, three pounds of Feild's oil soap, or the best mottled soap, and while it



is getting cold make up the spiriting, cleaning, and rinsing liquors ; have three tubs, and put six pails of water in each tub, and a pailful of melted soap into each of the two first, and half a pail into the third. Put in the large kettle six pails of clean cold water, and a quarter of a teacupful of oil of vitriol. Stir well in the water. Now everything is ready to clean the work without stoppage, call the man to help, and we will suppose it is a claret woollen ground, with green, blue, pink, crimson, or amber silk in the damask pattern, and these are the most difficult colors to clean safe. Put it in the first liquor, under a peg, work it well for one minute, take it up by the selvage, and with the man wring it well over the tub ; put it back in the same liquor for one minute, work it well, get it up and wring it again on the peg over the tub.

Now work it in and wring it out of the second tub, put it back for one minute, working it well in the soap this second time, and take it up ; put it across the peg, the tub under it, and wring it up again, and put it into the third liquor ; this is the thin soap liquor, and work it well in it, get it up, wring it on the peg, and handle it directly out of the soap into the spirits, and wring it up out of it on the peg, put it back, handle it well for a minute, and throw it up to drain. Now empty the tub you gave it the first liquor in, rinse it, and put ten pails of water in it and half a teacupful of oil of vitriol, and handle it well in this, wring, return it a couple of times, and put it on a peg to drain. Throw away this water, and give it another with a quarter of a teacupful of oil of vitriol in it, and twelve pails of cold water, work it well in this, wring it well out of it for a finish, and it is done. The next process is to dry it in clean sheets before it is hung up ; this sheeting up dry cannot be omitted, the whole safety of the colors depend on how it is sheeted up. This one curtain will take six sheets to dry it. Now that it is sheeted up and nearly dry, hang it up in a warm room, and as there are generally four curtains to a bed or window, help these liquors you have

just used with more fresh soap liquor, clean and sheet up dry the other three, one by one, exactly in the same manner and time you did the first. When all are done and dry, damp, brush, and send them to the pressers to be finished, and they are done. When returned from the pressers and ready for re-making, they will look as well as if they had never been wetted.

#### HINTS RELATING TO COLOR AND COMPLEXION.

*Red Drapery.*—Rose-red cannot be put in contact with the rosiest complexions without causing them to lose some of their freshness. Dark red is less objectionable for certain complexions than rose-red, because, being higher than this latter, it tends to impart whiteness to them in consequence of contrast of tone.

*Green Drapery.*—A delicate green is, on the contrary, favorable to all fair complexions which are deficient in rose, and which may have more imparted to them without inconvenience. But it is not as favorable to complexions that are more red than rosy, nor to those that have a tint of orange mixed with brown, because the red they add to this tint will be of brick-red hue. In the latter case a dark green will be less objectionable than a delicate green.

*Yellow Drapery.*—Yellow imparts violet to a fair skin, and in this view it is less favorable than the delicate green. To those skins which are more yellow than orange it imparts white; but this combination is very dull and heavy for a fair complexion. When the skin is tinted more with orange than yellow, we can make it roseate by neutralizing the yellow. It produces this effect upon the black-haired type, and it is thus that it suits brunettes.

*Violet Draperies.*—Violet, the complementary of yellow, produces contrary effects; thus it imparts some greenish-yellow to fair complexions. It augments the yellow tint of yellow and orange skins. The little blue there may be in a complexion it makes green. Violet,

then, is one of the least favorable colors to the skin, at least, when it is not sufficiently deep, to whiten it by contrast of tone.

*Blue Drapery.*—Blue imparts orange, which it is susceptible of allying itself favorably to white and the light flesh tints of fair complexions, which have already a more or less determined tint of this color. Blue is, then, suitable to most blondes, and in this case justifies its reputation. It will not suit brunettes since they have already too much of the orange.

*Orange Drapery.*—Orange is too brilliant to be elegant ; it makes fair complexions blue, whitens those which have an orange tint, and gives a green hue to those of a yellow tint.

*White Drapery.*—Drapery of a lustreless white, such as cambric muslin, assorts well with a fresh complexion, of which it relieves the rose color ; but it is unsuitable to complexions which have a disagreeable tint, because white always exalts all colors by raising their tone ; consequently it is unsuitable to those skins which, without having this disagreeable tint, very nearly approach it. Very light white draperies, such as muslin, plait or pointed lace, have an entirely different aspect.

*Black Drapery.*—Black draperies, lowering the tone of the colors with which they are in juxtaposition, whiten the skin ; but if the vermilion or rosy parts are to a certain point distant from the drapery, it will follow that, although lowered in tone, they appear relatively to the white parts of the skin contiguous to this same drapery, redder than if the contiguity to the back did not exist.  
—*Harmony of Colors, by M. E. Chevreul.*

## FRENCH CLEANING.

### REMARKS ON CLEANING SILK FABRICS WITH CAMPHENE.

French cleaning, as it is called, has no more to do with the French nation, than it has to do with the



English, but everything must have a name. It would not do to call it Scotch or Irish cleaning. No! no! that would not go down with the fashionable classes, so when we want to clean in camphene we tell our customers this work must be cleaned the French way, just to please them, and they think it must be good because it has a French name. English and Watson's camphene is considered the best for dry cleaning on silks. The French know no more of cleaning in camphene than the English, and the reason is simply this: camphene as it comes from the makers must have nothing added to it; if you put water, spirit, or soap in it, or any alkali, it is spoiled. It cleans all sorts of silk fabrics, when not very dirty, in such a manner that nobody would ever think they had been wetted; to clean them properly, they must be passed through one, two, or even three separate liquors of it. It neither changes or alters color, but it takes the dirt, oil, and grease out of silks, cotton, and wool, assisted by labor, and the work must not be rinsed or spirited after it has been through a liquor of it; after that it must be sheeted up dry directly, but it will not clean work that is too much worn or soiled, that must be taken apart and cleaned, in what is called the English way, and a very good way it is, for it takes all the grease and dirt out of it effectually, and improves both silk and color when done with judgment and care.—See Thorough Cleaning, previously described.

### *Board for French Cleaning.*

A scouring-board for French cleaning ought to be six feet long, three feet wide, one inch thick, and made of American pine without splits or knots, and very smooth and strong; one side of it to be covered with green or drab cloth, fastened by tin tacks to the edges and ends of the board, and made as tight and as smooth as a billiard table. The other side is to have no covering on it; this way it will answer two purposes in French cleaning, as will presently be seen. With this board three brushes

will be wanted to work the camphene, which brushes can be bought at Mr. Lilly's, brushmaker, Wakefield street, Regent square, Bloomsbury, London, he makes all the brushes used for dyers, scourers, and French cleaners, where they are always ready; other brushmakers do not understand our want in brushes so well as he does, for he makes it his study and has the trade. They are not unlike the white hair brush with taper ends, used in dusting and brushing coach linings. There must also be a sponge, clean flannels, also clean India cotton cloths. When all these things are ready, the French cleaning may be commenced and continued with a certainty of success. King, Seymour street, Euston square, and Legg, Wardour street, Soho, sell English and Watson's camphene, and almost all oil shops and drysalers in London and the principal towns in the country sell it. When the camphene has cleaned the work, and is too dirty to be used again, it is taken back to the shop it was bought at and exchanged for clean. The camphene is sold in sealed tin boxes or cans, in quarts, half gallons, and gallons. These tins must be paid for or returned.

*To Dry-Clean Figured Silk Damask Curtains with Camphene.*

This is very nice work, and requires great care and expedition in the execution of it; and as figured silk damask, where there is a variety of colors in it, is the most difficult to clean, I will begin with that first. Silk damask, bed and window curtains, seldom have any linings, and are generally from three to six yards long, and from three to six widths wide. I will have one curtain of four widths wide, well shook, brushed, and taken apart, and begin and clean one breadth, say four yards long, and as they must be cleaned one breadth at a time I will begin with it. Have the camphene board, brushes, and sheets, as per instructions, all ready, and put one gallon of camphene in an earthenware pan that

will hold four gallons, and put the width in it; handle it in the camphene until it is well soaked in it, which will be in two minutes; now fold it up on a peg, over the pan, to save the liquor that drains from it, and put it instantly on your camphene scouring-board, wrong side up, and brush it well; then turn up the right side, and do the same with it. Now pass it again through the camphene, and fold it up on the peg over the pan, squeeze as much of the spirit out of it as you can, and turn the board wood side up, put your sheets on it, and sheet up the width you have just cleaned directly, one sheet after the other, until it is dry, and then brush it well on both sides and hang it up to air, as well as to take off the smell of the camphene, which the air is sure to do. A hot stove room is the best place to dry and take the smell of the camphene off the work, and the hotter the place is the sooner the camphene is expelled. There are three breadths of this curtain we began with, the others must be cleaned, sheeted up, dried, and brushed, one by one, exactly in the same manner as the first. Now they are ready for dressing, and some persons roll or frame (see frame, p. 28) them for a finish with a teacupful of parchment size of the first boil to four quarts of clean cold water, carefully wetted with a clean sponge, and dried with the charcoal fire directly, and they are done. Send them to the pressers to finish, and I am sure this is the best, cleanest and the cheapest finish. Some dyers and scourers prefer damping, brushing, and calendering only as a finish for this work, and others will frame or roll it only, it all depends on the quality of the work and how it is dressed.

REMARKS.—Time is everything in cleaning in this work. If the operator is a dawdler, or hangs on, the work is sure to suffer, as everything else does. Each of these widths, from the time it was put in the camphene until it was hung up to air, ought not to take more than fifteen minutes from first to last. More work wants more camphene and dry sheets, and done the same way.



*To Dry-Clean Blue, Amber, and Green Plain Satin  
Curtains.*

First, well shake and brush these curtains and take them apart; and supposing there are three curtains, each four widths wide and four yards long, I shall take one width from each curtain to clean.

Have one gallon and a half of camphene for the three widths, and have two clean stoneware pans that will hold two gallons each, and put two quarts of camphene in each pan, having the board, brushes, and drying cloths all ready at hand.

Begin with the blue satin width, and in one of the pans with the camphene in it, which I shall call the first liquor, wet it well, and get it up directly to drain over the pan for a minute. Put it on the board the wrong side of the silk up—I will call the board the wrong side where there is no cloth on it—and brush it well with a soft brush. The brush must be occasionally wetted in the camphene. When the wrong side is cleaned all over, turn the right side up and clean it also with the brush, and return it in the first liquor; then in the second liquor; drain it, turn your board, and dry the width with the cloths. When dry, brush it on the wrong side first, and then the right side with a dry brush. Then hang it up, to take the smell off it, and it is ready for dressing.

The next width to clean is the amber. This is to be cleaned exactly like the blue. The next is the green. This is also to be cleaned in like manner, and when the camphene is done with, both liquors are to be put in one jar and well corked, and it will be fit to use again for dark-colored silks. If not it can be exchanged for fresh where it was bought. They will give a pint of clean camphene in return for a quart of that which has been used.

The next process is the dressing of the satin. In general it is finished in the frame (see "Frame," page 28), and sent to the calenderer's afterwards, when it is done.

Another very simple and good way to finish cleaned satin is, to lightly damp it in clean sheets, then brush it, and send it to the presser's to be finished, when it is done.

REMARKS.—I have one cleaned one width of each of these three curtains in order to simplify the matter. If my directions to clean one width are strictly followed, an unlimited number may be done in the same manner; and the more there are to clean, the less camphene in proportion is required—that is, it will take considerably less camphene to clean twenty widths at one time than it would to clean the same number at so many different and distinct periods.

*To Dry-Clean Crimson Watered Tabaret Curtains.*

Among my readers that are not dyers, drapers, or upholsterers, will be found many persons who will think it is tabinet I mean. It is no such thing; tabinet is plain or figured Irish poplin for ladies' dresses, this Irish poplin will clean with camphene exactly in the same way as tabaret, and nobody would ever think it was cleaned, it is made of silk and worsted, plain or figured, whereas tabaret is made of silk and cotton, plain, striped or figured, and is never used for any other purpose than for bed and window curtains, and for covering sofas, chairs, ottomans, and coach linings. It is very much used for drawing and sitting-room walls, instead of paper, paint, or tapestry, and when used for this purpose it is not put on tight and flat like paper or tapestry, but fluted, and has a magnificent appearance. Tabaret (tabbarea some call it) curtains are always lined with tammy. The material or fabric of this tammy is a thin woollen glazed stuff, and always the color of the curtains, and ought, when the curtains are taken to pieces, to be wet, cleaned, and re-glazed on the side that was inside before they were taken apart. Sometimes this tammy lining wants re-dyeing, which is mostly done if the tabaret is in a

good state, and will look like new when cleaned and glazed.

Crimsons, ambers, drabs, greens, and blues are the prevailing colors for tabarets. I will begin with the crimson, as for one yard of any other color that is cleaned there are fifty for crimson.

Take one curtain of three widths, and three yards long; well shake, brush, and take it apart, and have your board, brushes, and drying-cloths ready. Divide one gallon of camphene into two stone pans, and take one width and put it through one of the pans with the camphene in it; then put it on the board, wrong side up, and clean this side with the brush and camphene; then turn it, and do the right side in like manner; and when this is done, pass it again through the liquor you first gave, then the other liquor. Let it drain over this liquor a minute, and then sheet it up dry with the cotton or linen cloths; when this is done, brush it with a dry brush, and it will look as if it had never been wetted. Hang it up to take away the smell of the camphene; if in the summer the air will do, if in winter it must be hung up in a warm room; the smell will go off in a few hours. Clean the other two widths in like manner, and so go on to any extent, with fresh camphene liquor. The next process is the finishing, by first putting them in a half-dry sheet to damp for a few minutes; then take them out, brush and rub them, and send them to the presser's to be watered, and they are done.

REMARKS.—I have been very careful in describing how this work is to be cleaned, as there is always a great deal of it doing every year, and if my directions are strictly attended to it will look as well as new.

### *To Clean Tammy Lining and Lace Fringes.*

I think it not at all out of place here to give directions how to clean and finish the tammy linings, the lace and the fringes of the above curtains.



First Method.—The lace or gimp (the gimp to be turned inside out in putting it on the curtains again), is to follow the curtains in the camphene, and to be cleaned, rubbed, and dried in cloths, piece by piece, like the widths. The tammy lining is to follow in the same camphene, a breadth at a time, and, instead of using a brush that was used with the outside of the tabaret curtains, use flannel to rub the dirt out of them ; do not return them in the camphene, but rub them dry with the cloths after the flannels ; air them, and have them re-glazed on the side that was in, and they will look as well as new. This tammy sometimes does without re-glazing ; cleaning this way does not take the gloss off.

Second Method.—Take the inside of a stale loaf and a quart of silver sand, mix them, and damp them with camphene ; put a dry width of the tammy on the board, and work the mixture well into the tammy on both sides, then shake and brush the width, and it is cleaned ; again damp with camphene the bread and sand, and proceed with the other widths of tammy if there were one hundred of them, in the same manner as the first, and they are done.

Third Method.—Thoroughly clean them, and, there being nine yards of tammy and two yards of bullion fringe, dissolve one bar of the best soap in four gallons of scalding hot water, and have three clean vessels ; put two gallons of cold water in each vessel and put two gallons of the melted soap in the first one, and half in the second, and half a gallon in the third vessel as a thin soap liquor for the last. Have the three widths of tammy tacked end by end, and proceed with the cleaning by putting them in the first soap liquor ; work them well in it, get them out, and put them in the second ; work them well in it, get them out and put them in the third liquor ; handle them well in this, and put them on a clean peg to drain. Now have a clean vessel, and put eight gallons of cold water and a tablespoonful of oil of vitriol in it ; mix it well in the water ; take the tammy

lining out of the soap and handle it well in this spirit for five minutes; get it out, and give it one clean cold water for one minute; get it out, hang it up to dry, and when dry, have it glazed on the side that was inside, and it is done ready to line again like new, to make up with the tabaret curtains.

The crimson bullion fringe is the next to clean. This fringe will clean well in the soap liquors the crimson tammy lining left, exactly in the same manner, giving it first, second, and third soap liquors, and another tablespoonful of vitriol in the same spirits, and a clean cold water after the spirits. Now dry it in a warm room, and when dry it is ready to hang up with the curtains.

REMARKS.—I have given directions how to clean and finish this crimson tabaret curtain, crimson tammy lining, lace and fringe; and to make the reader understand me, I have confined my instructions to one curtain only; for if there were fifty, they must be cleaned only one breadth at a time for one man; and I have selected crimson from among the number of colors as the most difficult to clean, and at present the most in use.

### *To Dry-clean and Finish Tabaret Curtains of any Color.*

When there is blue, fawn, or any light color among the tabarets for cleaning, we always begin with the blues. Have clean vessels, camphene, cloths, and brushes all ready. When the blue is cleaned the lightest colors follow, always taking care to clean only one width at a time; and as this work must be cleaned and finished in every way like the crimson with camphene, I must refer my reader for instructions to clean any color of the above work to the section on "Dry-cleaning Crimson Tabarets," page 314.

The tammy linings, lace, and fringe are to be cleaned, either wet or dry, in the same way as the linings, lace, and fringe of the crimson tabarets.

In some fringes there are spickets covered with silk. These are always taken off, and dry-cleaned with stale

bread or camphene; and when the silk on the spicket is worn out, they are sent to a fringe-maker to be re-silked, and they then look as well as new. Cameron, George yard, Crown street, Soho, is the fringe-maker mostly employed by dyers at the west end of London.

*To Clean Brocaded Silk or Satin Dresses.*

When silk dresses are very much soiled, they must be taken apart to be thoroughly cleaned, and if properly done will look as well as new. Dissolve two pounds of soft soap, mottled soap, or Feild's palm soap in eight quarts of water, and use when cold. Make up three cold waters of four pails each, in three separate vessels, and another one for the spiriting; dissolve in this a quarter of a pound of tartaric acid, and have ready three clean sheets. Begin and clean a dress, one width at a time. Have a board longer and wider than a width of the dress; place the width flat on it, wrong side up, and pour as much of the melted soap over it as will wet it regularly; have a soft brush and clean it well, then turn it on the right, and do the same with it. When this is done, put it through a small thin soap liquor, then one rinsing water, then another, and the third and last the spirits; handle it well in the spirits, and hang it up to drain. Now open out a sheet on a dry board, or table, and dry the width you have just cleaned in it; brush it with a dry brush, and it is clean, ready to finish. Clean the remainder of the dress exactly in the same manner as the width, taking care to clean and sheet up only one width or piece at a time, and to do it quickly, for if it is more than five minutes doing from first to last it will be spoiled.

*Handkerchiefs, Scarfs, and Ribbons*, are cleaned in the same manner. I have confined myself to cleaning one width at a time, so as not to confuse anybody that likes to clean a silk dress, handkerchiefs, scarfs, ribbons, &c. An unlimited number of breadths and pieces can be cleaned with ease on the same principle. This is what



is understood by the trade as the English method, and it is the best, for it thoroughly cleans the silk both sides.

*French Board to Finish Silks.*

Have a deal board about four feet six inches long, two feet wide, and one inch thick ; cover this loosely with fine green or drab baize, well tacked down at the edges of the board, and stuff it with wool from each end until it is very tight and regular, with a rise in the centre and sloping towards the edges. When this is done fasten down the two ends like the sides, and the French board for dressing silks is made ready for use. Now take a width of silk or satin that has been cleaned or dyed, and place it flat on the baize, and sponge it over with size and water mixed. When this is done, pin down one end, keeping the pins one inch apart, then the other end, well stretching it, and then the two sides ; rub it with the damp sponge and dry it before the fire, and when dry unpin it, and it is finished. When there are a number of boards one pair of hands can finish several dresses in a day.

The English method of finishing silks is by framing (see page 28) ; handkerchiefs and scarfs are finished as directed above. Another method is to have them dressed at the presser's. Satins, scarfs, and handkerchiefs look very well done so.

*To Dry-Clean a Pale Blue Silk and a Pale Green Satin Dress, taken apart.*

Have one gallon of camphene, and divide it in equal parts in two clean earthen pans, that will hold two gallons each. Have a clean board longer and wider than a width of silk, a clean brush, and two clean sheets at hand, and begin and clean the pale blue silk. Take one breadth from the dress and put it in the first liquor of camphene, and from it on the board ; wet the brush in the camphene, and brush the width lengthwise with

it; when this is done pass it again through the first liquor of camphene, then the second, and hang it over this liquor to drain but only one minute. Then place a clean sheet on the board, and put the width flat on it; cover it in different parts of the sheet, and so dry it. Hang it up in a hot room to take the smell of the camphene off, which will be in a few hours. Take another width and do the same with it as the first, and so go on with one width after another until the dress is cleaned, which must be done with great expedition to keep it all one color and its color.

Without changing the camphene, board, or sheets, proceed with cleaning the pale green satin dress: Begin with one breadth, and put it in the first liquor of camphene left from the blue silk; then lay it flat on the board, wrong side up, and brush it gently lengthwise. If silks or satins are brushed across the width it frays, and spoils them for wear; turn it on the right side, and brush that side gently also; pass it through the first, then the second liquor of camphene; drain it, spread the sheet on the board, and dry the satin with it; if necessary, give it a second sheet; brush it with a dry brush on the face lengthwise, hang it to air, and it is cleaned. Proceed with the remainder of the dress, piece by piece, in the same manner, until it is all cleaned. Finish the two dresses on the French board, the frame, or send the satin to the presser, for him to finish it. Both dresses ought to look like new, there is nothing to hinder it; if my instructions are particularly attended to I would bet my life on the result.

### *To Clean whole Silk or Satin Dresses.*

The safest way to dry-clean a silk or satin dress of any color is, to take the body off the skirt, and clean each part separately. If the dress is a valuable one, take off the sleeves also. When they are cleaned, re-make them, all the French workmen do it, why not the English, let

us follow a good example no matter where it comes from.

Have two clean earthen vessels that will hold two gallons each, and put half-a-gallon of camphene in each; have a smooth board, six feet long and three feet wide, suitable brushes, and four or five clean sheets. Be very particular about the sheets being dry and clean. Your sheeting board is not to be encumbered with all your sheets on it, have only one on it. Some people make a dreadful mess of their work with the best intention, from their slovenly habits, such people must bear in mind the song of Darby Kelly—

“That in his wrist he had the twist.”

Begin by cleaning the body first. Put the body in the first liquor of camphene, then lift it on to the board, brush the inside well, and then the outside. When this has been done, put it back in the first liquor of camphene, then in the second, and let it drain over the second a minute; spread a sheet on the board, lay the dress on it, and directly begin and rub it dry with the clean Indian cotton cloths. While rubbing it, keep it smooth and shape it, so as that, when dry and cleaned, it will look as if it had not been wetted. Take the sleeves next. Clean them in the same manner as the body. The skirt comes next, one after another, and it is to be cleaned exactly in the same manner as the body and the sleeves, by passing it through the two camphene liquors, brushing and sheeting it up dry before leaving it. Dispatch is the life and soul of this work, as the camphene is of such a drying nature that it requires great expedition in the cleaning. When the dress is done, it must be hung up for some hours in an airy room. The smell of the camphene will come off in a few hours in a very hot stove room. The best method is to clean the camphene work in the afternoon and hang it in the stove all night to take the smell off. Any silk or satin dress can be cleaned whole by this method, but it is safer to take the



skirt off the body, which most cleaners do that intend not to be beat.

*To Dry-clean a printed Silk Shawl or Scarf.*

These shawls and scarfs are printed gauze, printed China crape, and brocaded silk. When they are very much soiled, they are cleaned with Feild's soft soap. Rinse out of the soap, and then a little tartaric acid and cold water, wring them, and dry instantly in the dry clean sheets, and they are done. But when they are not much soiled they are cleaned in camphene, either way is proper.

Have two vessels that will hold two pails each, and put two quarts of camphene in each vessel and have a clean board, and three sheets ready for use. Take the shawl first and handle it in the first liquor of camphene, then the second, and squeeze it tightly out of the camphene, sheet it up dry, and rub it well with the flower, with a fine cloth until it is dry, hang it up in the air, and it is done.

The next is the scarf. Clean this in the same way as the shawl in every respect, and it is done.

Gentlemen's fancy waistcoats, silk handkerchiefs, ribbons, ladies' mantles and scarfs, are all cleaned in the same manner, with camphene, and dried in sheets directly, and rubbed down well while damp to put them in proper shape, and ironed with a box iron for a finish.

Paisley, and other shawls, are cleaned thoroughly, sheeted up dry, and finished at the presser's; ladies' white satin shoes are cleaned with camphene, and rubbed dry with dry bread.

*To Clean and Finish Three Table Covers.*

I will take three of the most difficult table-covers to clean, viz., one blue and white cotton and worsted, one amber and claret, silk and worsted, and one printed cloth table-cover.

Dissolve one bar of the best mottled soap in four gallons of scalding water, and put one pound of pearlash in it. Have three vessels that will hold eight gallons of water each, and put in the first one pail of cold water and three gallons of soap liquor; in the second, one pail of cold water and two gallons of soap liquor; and in the third, two pails of cold water and one gallon of soap liquor. Have a vessel also with six pails of cold water, and a tablespoonful of oil of vitriol in it. Begin cleaning the table-covers by taking the blue and white first, and handle and rub it well in the first soap liquor; wring it well out, and put it in the second, handle and rub it in this and wring it, and put it in the third soap liquor, and do the same with it; wring it out of this and put it in the spirits, handle it for five minutes in this, get it up, and give it one cold water; fold it up to drain and hang it up to dry, and it is done.

The next is the amber and claret. Clean this in the first, second, and third soap liquors, after the blue cover, and instead of spiriting it, give it a pound of common table-salt in two pails of water, and work it well in it, and give it a couple of cold waters after the salt water, and hang it up to dry in a warm room, and it is done.

The next is the printed cloth table-cover. Clean this in the same soap liquors the other two have left, and give it a clean cold water directly out of the last soap liquor, with a tablespoonful of oil of vitriol in it; handle it well in this, and give it another cold water with a tablespoonful of vitriol in it, and after it, one cold water, fold and drain it, hang it to dry in a warm room, and it is done. It must be dried quick, as there is a variety of colors in it, and they will run into one another if too long about.

Now these three table-covers are cleaned and dried. The next process is the pressing, and when that is done, they will look as well as new. They must be well shook and brushed before they are sent to the presser's.

## DIFFERENT SOAPS USED BY DYERS AND SCOURERS.

THE best mottled soap has the preference and always will have, from the quantity of the best tallow that is in it, and the small quantity of alkali used in making it; but it must be used at least blood-warm to get into the work, and that does not do for particular sorts of cleaning; the only draw-back on it is that when it is melted and cold it is congealed, and will not do so well for cold scouring and cleaning.

Yellow soap is the next hard soap, and although it is cheaper in price, it is dearer in the use of it, from the quantity of fat, resin, oil, and other foreign matter that is put into it, to take the place of the tallow; it is seldom a dyer and scourer uses it, and it congeals when melted, so it is not much good for cold cleaning.

The common soft soap is made from fish oil, and is not fit for general use, on account of the smell of the fish oil stopping in the work; it has one advantage in it for us, that is, when it is dissolved it does not congeal, and when cold it gets into the work and cleans it directly without injury, and the oil that is in it improves the silk and the color if the operator is not too long about the cleaning. This soap is now very little used by dyers and scourers on account of the smell, but it was always used until lately; the smell is easily got rid of in cold cleaning, but it is the trouble we otherwise have to do so that makes us not use it commonly.

Feild's soft and hard soap is in general use of late years by dyers and scourers. It is made from palm oil, and is very nourishing to silk and wool; does not congeal when melted, and on that account is good for cold cleaning; does not injure the color if used with dispatch and care, and has no unpleasant smell; is cheaper than the other soaps; and on account of these general good qualities, it is more used in the trade than any other.



## APPENDIX.

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### GENERAL INSTRUCTIONS FOR THE USE OF ANILINE COLORS.

MESSRS. ANDREYKOVICZ & DUNK, Importers and Manufacturing Chemists, 156 North Third Street, Philadelphia, and 213 E. Madison Street, Chicago, furnish the following general instructions for the use of aniline colors:—

#### GENERAL RULES.

FIRST. Divide the quantity of Dye to be used in five parts, begin the dyeing with one part, and let the bath not be over 100 degrees. All the color being taken up by the yarn, add another part, and allow the heat to rise up to a boil, and so keep adding the color at intervals.

SECOND. Heat and acids produce bluer shades with all aniline colors. To obtain redder shades of violet and blue use less acid, and do not boil long.

#### ROSANILINE, SOLFERINO, OR MAGENTA CRYSTALS.

##### SOLUTION.

*Magenta* may be dissolved either in water alone, or in alcohol mixed with its volume of water. The solution in water is made by adding to one part of crystals 200 parts of cold water, and heating the liquid until the solution is completed, stirring constantly during the operation. The solution in alcohol is effected by adding to one part of crystals not more than 30 parts of cold diluted alcohol and heating the same, stirring from time to time until all is dissolved.

## DYEING.

SILK.—To be dyed lukewarm with a small addition of Tartaric Acid.

WOOL.—To be dyed boiling, but without any acid.

COTTON.—Can only be dyed after having been mordanted, which is usually done with a mixture of Olive Oil and Sulphuric Acid, same as for Turkey Red; the following proportions are very good:—

For 55 lbs. of *Cotton* you mix 12 ozs. of Olive Oil with 3 ozs. of Sulphuric Acid, and stir the mixture up for about a quarter of an hour, until it becomes brown and heated. You then add three-fourths of a quart of Alcohol until the solution is complete. This mordant diluted with several quarts of boiling water is afterwards thrown into a lukewarm bath, wherein you mordant the *Cotton*, and then dry by heat.

The following is a new process for obtaining a good and cheap mordant:—

For 55 lbs. of *Cotton*, you dissolve 36 ozs. of tallow-soap in water, and add this solution to a hot water bath, through which you draw the *Cotton* for about a quarter of an hour, then wring three times, and dry it. Cheese dissolved in Ammonia may be used to advantage instead of soap.

## DYEING.

To a hot water bath add the decoction of 3 lbs. Sumach, then the dried, mordanted *Cotton*, and draw it six times through the bath, after which add 9 ozs. of Bichloride of Tin; again draw the *Cotton* through, say about eight times, then wring it three or four times.

A new bath is then prepared, to which the aqueous solution of  $5\frac{1}{2}$  ozs. of *Magenta* is gradually added; you dye the *Cotton* about a quarter of an hour, then wash and dry.

## PRINTING.

For *Silk* and *Wool* the diluted alcoholic solution, thickened with Gum, is used; for *Cotton warp*, you thicken with a mixture

of solution of Tragacanth, of Gum, and of Albumen (for instance, 5 parts of the first, 5 parts of the second, and one part of the last solution). To prevent the running of Aniline colors, thickened with Albumen and Gum, an addition of Glycerin is recommended, which keeps the prints nicely moist, and the colors also dry slower, and obtain more brightness.

### CERISE.

The difference between this color and Magenta is simply that the first dyes a considerably yellower tint than the second. With *Cerise* you can easily produce various shades of browns, which otherwise can only be obtained, with difficulty, by mixing different dyes, such as Orchil, Extract of Orchil or Cudbear, and Brazil wood.

By adding other dye-stuffs, such as Sulphate of Indigo or Turmeric, brown shades are obtained, which are equal to the best browns dyed with Orchil. *Cerise* alone and in combination with other dye-stuffs, is evenly and easily dyed, producing very brilliant shades; it costs only one-third of those obtained from Orchil, and one-half of Brazil wood colors.

### SOLUTION.

In boiling water, same as Magenta, and filter before using.

### DYEING.

**SILK.**—Add to a hot bath a small quantity of soap, and throw a solution of *Cerise* into it, and dye hot. *Silk* has to be washed in cold water, and then drawn through a cold bath slightly acidulated with Sulphuric Acid. The colors thus obtained are very bright, and if you shade with Picric Acid, you can produce tints as fine as those dyed with Cochineal.

**WOOL.**—Dissolve 2 lbs. of *Cerise* in 5 quarts of Acetic Acid, or boiling water, and throw this solution into about 70 gallons of water, then boil and filter. If you use for instance half of this solution, you add for every 10 lbs. of *Wool*, 16 ozs. of prepared Cream of Tartar, and then dye in this bath until the shade is sufficiently deep; for yellowish shades, you add Tur-



meric, and for bluish and deep shades, Sulphate of Indigo, which is prepared by dissolving 2 lbs. of Indigo, in 8 lbs. of strong Nordhausen Sulphuric Acid, and throwing this solution into 6 quarts of water.

For 60 lbs. of *Wool* you take 1 lb. of *Cerise*, 6 lbs. of Acetic Acid, and  $2\frac{1}{2}$  lbs. of Solution of Indigo.

The following is a more economical process: For 10 lbs. of *Embroidery Wool* you take the filtered solution of 3 ozs. of *Cerise*, 4 ozs. of Turmeric, and 1 oz. of Bichromate of Potash, and as much Sulphate of Indigo as you require for the intensity of the desired shade. For the fashionable shades or yellowish browns, you have to use Cream of Tartar and Alum (Sulphate of Alumina).

WOOL IN FLOCKS.—To dye 100 lbs. of *Flocks* a clear brown, you take 48 ozs. of Bichromate of Potash and 24 ozs. of Sulphuric Acid, and boil this mixture for an hour. You then prepare a bath, and add to it 40 ozs. of *Cerise*, and 48 ozs. of Sal Ammoniac, and boil for ten minutes in this bath. You deepen the shade with a decoction of Logwood.

COTTON.—As Magenta dyes pinks too bluish, *Cerise* is now used instead, and with success. The same mordants are used as for Magenta.

#### PRINTING.

SILK, WOOL, AND COTTON.—To be treated same as Magenta, and by adding Carmine of Indigo the Orchil shades are very well substituted.

#### SIENNA BROWN.

This color is equal to the other Aniline colors as regards brightness and easy working.

#### SOLUTION.

In strong Alcohol, by boiling. The solution to be filtered.

## DYEING.

SILK.—You dye in a bath acidulated with Sulphuric Acid, and of 40° C., to which a small quantity of soap has been added, heat gradually to the boiling point, and then wash in an acidulated bath. You can shade yellowish with Turmeric reddish, and deep by adding a few drops of Hofmann's Violet.

WOOL.—To be dyed boiling. You shade same as silk, with Turmeric and Hofmann's Violet, or else with Campeachy and Brazil wood.

COTTON.—Same as Magenta.

## PRINTING.

SILK.—Dissolve 7 ozs. Sienna Brown in 1 quart of boiling Alcohol, let this solution stand, and then filter. Afterwards thicken this preparation with 2 quarts of Gum water and 1 gill of Glycerin, and print.

Deeper shades can be obtained by adding a few drops of Alexandra reddish or Parme Hofmann, according to the shade required.

WOOL AND COTTON.—Same as Magenta.

## BLUES.

## SOLUBLE IN ALCOHOL.

## SOLUTION.

You require the most concentrated Alcohol, of which you take 30 parts for the reddish and bluish blues, and 40 and 50 parts for the greenish. You mix the powder with Alcohol, let it stand for a few hours, stirring from time to time, and then heat it in a water bath in a vessel to the top of which a tube is attached to condense the alcoholic vapors, afterwards you filter. If you let the solution stand for a day, you obtain brighter shades. Before using the solution, it is advisable to dilute it with about ten times its volume of cold water. Zinc vessels have to be strictly avoided in all these operations; they reduce the color.

## DYEING.

**SILK.**—You acidulate the bath with Sulphuric Acid, and commence dyeing at 40° C., and then increase the temperature to the boiling point, adding the color by degrees. When the desired shade is obtained, you wash the *Silk* in an acidulated hot bath, then wash, and afterwards draw through a cold soap bath, wash again, and pass through a boiling acidulated bath for greenish shades, and through a lukewarm for other shades.

Souples are dyed in the same manner, except that you add souple water.

**WOOL.**—To dye even, and to obtain fast shades, the *Wool* ought to be mordanted, during 30 to 45 minutes, as follows:—

*Embroidery Wool.*

For 20 lbs. of *Wool* you take:—

12 ozs. of Bichloride of Tin,

2 lbs. of Alum, and

20 ozs. of Sulphuric Acid.

*Carded Wool.*

For 20 lbs. of *Wool* you take:—

3 ozs. of Bichloride of Tin,

1½ lb. of Alum, and

1 lb. of Sulphuric Acid.

Afterwards wash carefully.

The *Wool* is dyed in an acidulated boiling bath, and add the color by degrees. After having dyed for about an hour, wash in an acidulated hot bath.

## PRINTING.

**COTTON.**—Dye first with Prussian Blue, and then shade with Aniline Blue.

On *Silk*, *Wool*, and *Cotton* same as Magenta.

## BLUES.

SOLUBLE IN WATER.

## SOLUTION.

In 50 parts of boiling water, then filter.

## DYEING.

**SILK.**—Same as the Blues soluble in Alcohol.

**WOOL.**—Wash the *Wool* with Soap and Soda, then rinse it



and pass it into a hot bath containing a small quantity of Silicate of Soda; afterwards into a cold bath slightly acidulated with Sulphuric Acid, and dye in an acidulated hot bath to which you add the solution of Blue. Boil until the desired shade is obtained, and then wash.

COTTON.—To be dyed in the same manner as the Blues soluble in Alcohol.

#### PRINTING.

WOOL AND SILK.—Thicken the solution with Gum and Glycerin, and proceed as usual.

COTTON.—Dissolve 1 oz. of soluble Blue in 20 ozs. of water, and one-fifth of an ounce of Carbonate of Soda, filter the solution, and when completely cold mix with it half a quart of Acetate of Alumina of 15° Bé., and 3 to 5 quarts of solution of Gum or Tragacanth, then print, steam, and wash in running water.

#### VIOLETS.

##### SOLUBLE IN ALCOHOL.

##### SOLUTION.

You must observe exactly the same instructions as for Blue, except that one part of *Violet* requires only 20 to 30 parts of strong Alcohol to effect the complete solution.

#### DYEING.

SILK.—To be dyed in the same manner as Blue, but with less Sulphuric Acid, and without washing in an acidulated bath.

WOOL.—The same mordants are used as for Blue, only a smaller quantity of Bichloride of Tin is employed for redder shades. The same violet will produce bluer shades if you use more acid and dye at a higher temperature; reddish shades require less acid, and the *Wool* should be left in the bath until it is cold.

COTTON.—The Cotton is mordanted with soap, in the same manner as Magenta, and put into a hot bath acidulated with

Sulphuric Acid; and then rinse and dye in a hot bath containing the necessary quantity of color, and  $4\frac{1}{2}$  ozs. of Bichloride of Tin. The colors thus obtained do not soil, and are preferable to those obtained by mordanting with Oil.

The following is another receipt for dyeing in proportion to 55 lbs. of cotton:—

Dye first with Prussian blue, then add to the hot water bath 11 ozs. of Bichloride of Tin, then the boiling solution of  $2\frac{1}{2}$  ozs. of Magenta, and when it is completed add the spirit solution of 2 ozs. Violet, draw the cotton six times through the bath, and wring it three or four times.

To fix the color and to prevent its soiling it is an improvement to add to the dye bath  $2\frac{1}{2}$  ozs. of starch.

#### PRINTING.

Same as with Magenta and Blue.

#### VIOLETS.

SOLUBLE IN WATER.

#### SOLUTION.

Dissolve in boiling water same as the Blues.

#### DYEING.

SILK.—Commence dyeing lukewarm in an acidulated bath, and increase the temperature gradually to the boiling point.

WOOL.—Same as Blue, soluble in water.

COTTON.—Same as Violet, soluble in Alcohol.

#### PRINTING.

SILK AND WOOL.—Same as Blue, soluble in water.

COTTON.—Dissolve  $1\frac{1}{2}$  oz. of *Violet* in 2 lbs. of water, and  $\frac{1}{3}$  oz. of Soda Crystals, filter, and add, when completely cold, 2 lbs. of Acetate of Alumina, and thicken with  $1\frac{1}{2}$  quart of solution of Tragacanth, print, steam, and wash.

## IODINE VIOLETS.

SOLUBLE IN ALCOHOL.

ALEXANDRA RED AND BLUE AND HOFMANN'S VIOLET.

The advantage these colors offer, is their greater brightness, especially by artificial light, and the facility with which they can be used.

## SOLUTION.

Dissolve in 10 parts of Alcohol.

## DYEING.

SILK.—In a very weak and acidulated bath, commencing lukewarm and increasing the heat to the boiling point.

WOOL.—To be dyed without acid or mordant in a boiling bath.

COTTON.—Same as the other violets.

## PRINTING.

On *Silk*, *Wool*, and *Cotton* same as the other colors.

## IODINE VIOLETS.

SOLUBLE IN WATER.

ALEXANDRA RED AND BLUE AND HOFMANN'S VIOLET.

## SOLUTION.

Boil one part of Violet with 50 parts of water, stirring frequently, and filter.

## DYEING.

Same as Iodine Violets, soluble in Alcohol.

## PRINTING.

Same as the other colors.



## ANILINE GREEN.

## IN PASTE OR POWDER.

This Green distinguishes itself by the purity of its shade, particularly by artificial light.

## SOLUTION.

Dilute the *paste* with 5 to 10 parts of cold water, and one-tenth part of Sal Ammoniac, and add the filtered solution to the dye-bath. By grinding the powder in the proportion of 1 to 3 Sal Ammoniac, a dark paste is produced, which dissolves easily in cold water. The *powder* can be dissolved equally well in concentrated Alcohol, by boiling in the same manner as the other colors.

## DYEING.

SILK.—Commence dyeing lukewarm, in a bath slightly acidulated with Sulphuric Acid, increase the temperature to the boiling point, and then leave the silk in the bath until the same becomes cold.

WOOL.—Dye with very little acid, and heat gradually up to 80° C. An addition of Alum is recommended.

COTTON.—The easiest mode of dyeing Green is by mordanting with Tannin.

## PREPARED ANILINE GREEN.

## SILK, WOOL, AND COTTON.

## PRINTING.

For *Silk*, *Wool*, and *Wool and Cotton*, Starch, Tragacanth, or Senegal Gum may be used for thickening.

To obtain a deep shade, two parts of the solution have to be mixed with one part of Prepared Green.

For *Cotton*, the best method is a mixture of three parts of thick solution Tragacanth with one part of solution of Albumen.

The mixture of Green with the solution has to be made *cold*, as heat before printing partially destroys the color.

Vessels of Metal have to be avoided, and those of Glass, Wood, or Earthenware, to be used.

The printed goods ought, same as the other aniline colors, not to be steamed too much, and have to be thoroughly washed after steaming.

Before the latter process, the Green will look grayish; steaming develops and fixes the color.

### ANILINE BLACK.

#### FOR PRINTING AND DYEING COTTON.

The fastest and most beautiful of all *Blacks* on *Cotton*. It will stand dyeing with Madder, and does not absorb any color, nor does it alter the same.

The use of this *Black* with its various operations depends upon different receipts, which are furnished on special demand.

### YELLOW AND ORANGE.

Dissolve in Water, dye boiling, with the addition of some Acetic Acid.

### GREEN.

#### WITH PICRIC ACID AND INDIGO CARMINE.

Mordant for 10 lbs. yarn,  $\frac{1}{2}$  lb. patent Alum, 2 ozs. Glauber Salt, 2 ozs. Oil of Vitriol, boil the yarn in it, and add enough Carmine Indigo to dye a deep blue.

If the shade is even, stop boiling, and add a little solution of Picric Acid, work the yarn well, and add more Picric until the shade is obtained.

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The New Patent or Concentrated Alum, the Double Chloride of Tin, the Prepared Tartar, as well as all kinds of New Dyes, can be procured of ANDREYKOVICZ & DUNK, 156 North Third Street, Philadelphia, Pa., and 213 E. Madison Street, Chicago.





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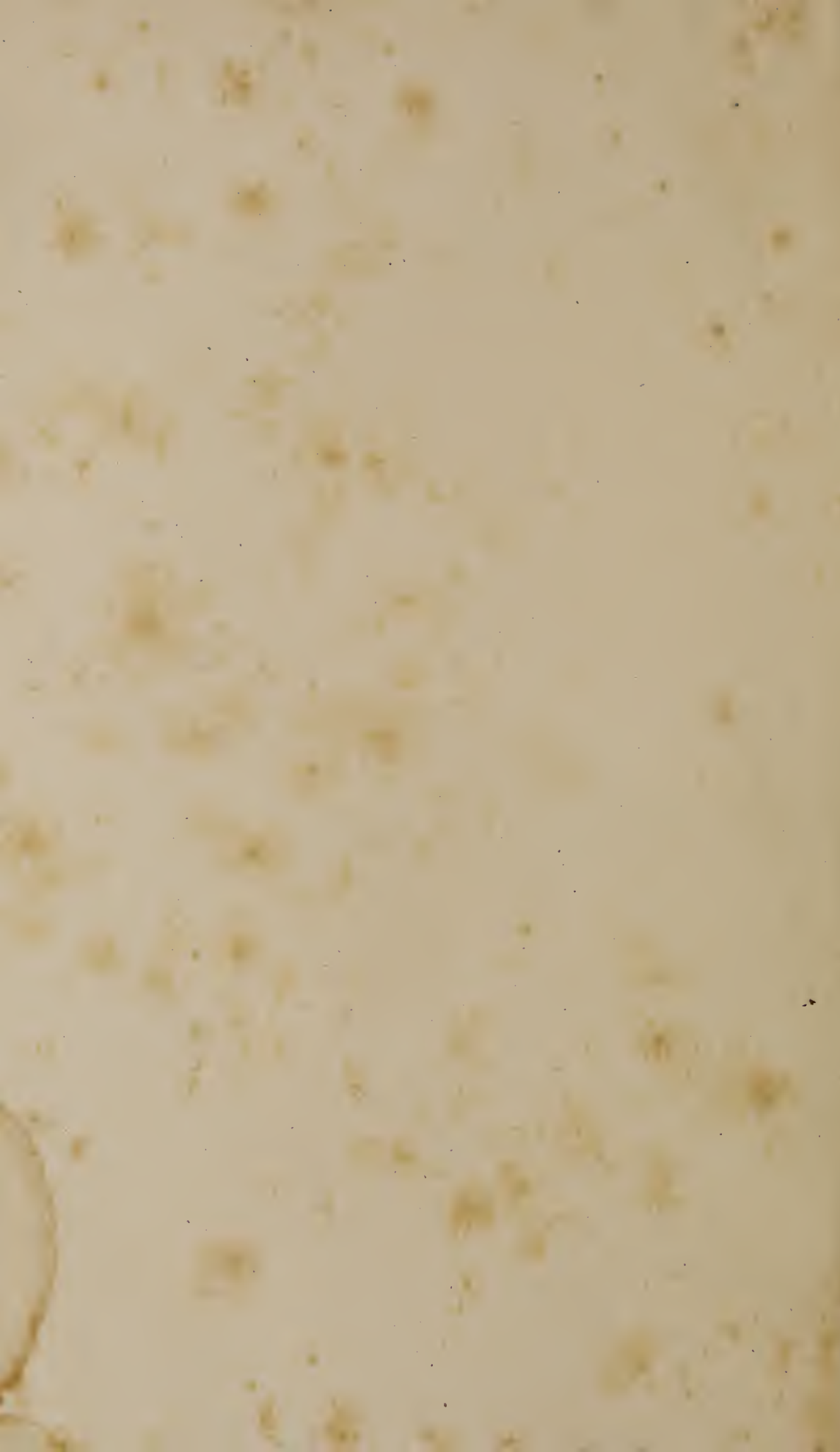
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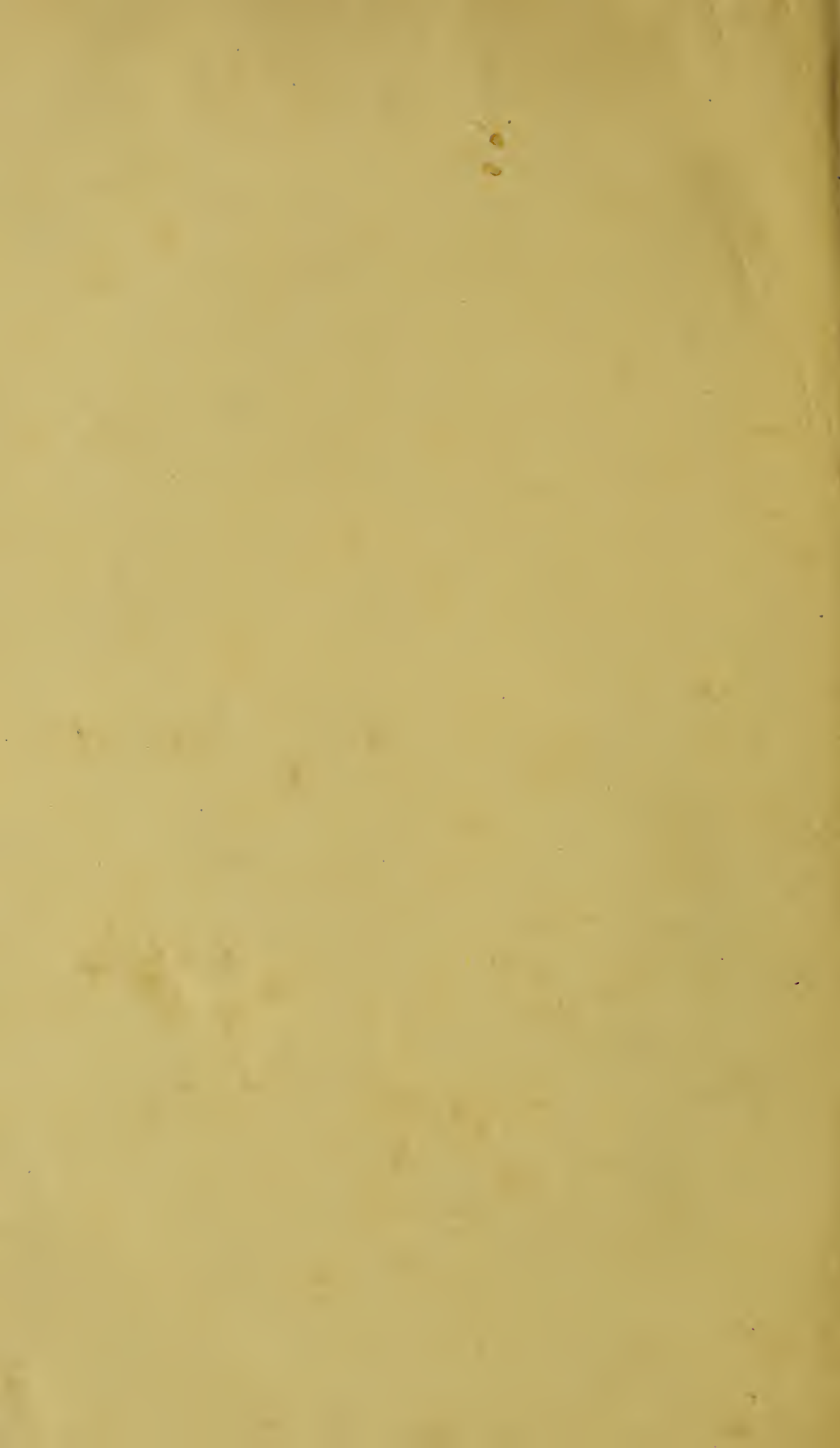














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